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MONTANA WETLANDS
MANAGEMENT STUDY

ATTACHMENTS

VOLUME II

ATTACHMENTS

ATTACHMENT	TITLE
Volume I	
A	National Food Security Act Manual (Selected Sections of the Sixth Amendment)
B	Montana's EPA State Wetlands Protection Grant Application - Components and Tasks
C	Federal Wetlands Delineation Manuals
C-1	1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands
C-2	Proposed Revisions to the Federal Manual for Delineating Wetlands
C-3	Corps of Engineers Wetlands Delineation Manual
D	National List of Plant Species that occur in Wetlands (Overview)
E	National Wetlands Priority Conservation Plan
F	Montana Wetlands Conservation Priority Plan
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Volume II	
G	Memorandum of Understanding between USFWS and FmHA
H	USFWS Mitigation Policy
I	State Council of Governments - Wetland Database Users Manual
J	Riparian and Wetland Classification Review
K	Wetlands and 401 Certification - Opportunities and Guidelines for State and Eligible Indian Tribes
L	Swampbusting: Wetland Conversion and Farm Programs
M	Directory of Federal Land Management Agency Wetland Contacts

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ATTACHMENTS
(Continued)

ATTACHMENT	TITLE
Volume II (Continued)	
N	State Acts, Policies, and Executive Orders Pertaining to Wetlands
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N-2	State of Washington, Executive Order EO 89-10, Protection of Wetlands
N-3	State of Washington, Executive Order EO 90-04, Protection of Wetlands
N-4	State of Washington, Department of Wildlife Wetlands Policy
N-5	State of Washington, Model Wetlands Protection Ordinance
N-6	Washington State Wetlands Rating System
N-7	Wyoming Wetlands Act
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N-9	Interagency Memorandum of Understanding for the Conservation of Wetland Resources associated with Highway Construction Projects in the State of Montana (1992)
O	SCS Wetland Determination Procedures
P	State Agency Wetland Programs and Contacts

Attachment G

MEMORANDUM OF UNDERSTANDING DETWEEN USFWS AND FmHA

MEMORANDUM OF UNDERSTANDING

BETWEEN

FARMERS HOME ADMINISTRATION AND THE U.S. FISH AND WILDLIFE SERVICE

ESTABLISHING PROCEDURES FOR INTERAGENCY COORDINATION ON

FISH AND WILDLIFE RESOURCE ISSUES AFFECTING FARMER PROGRAMS

Purpose and Policy

In complying with Federal environmental protection laws, regulations, and Executive Orders and assessing the potential environmental impacts of its actions, including the making of loans and disposal of lands or interests in such lands, the Farmers Home Administration (FmHA) consults with appropriate Federal, State, or local agencies on the technical aspects of environmental planning, including impact analysis and mitigation alternatives. This Memorandum of Understanding (MOU) sets forth the consultation procedures to be followed by FmHA and the U.S. Fish and Wildlife Service (Service). Of particular relevance to this MOU is FmHA's need to consult with the Service in implementing FmHA's affirmative responsibilities to protect and enhance wetland resources under the requirements of Executive Order 11990, Protection of Wetlands, and as further specified in 7 CFR Part 1940, Subpart G. This MOU does not supersede consultation as required under Section 7 of the Endangered Species Act; however, every effort will be made to use this MOU to facilitate early coordination on endangered species concerns.

The Service has the expertise and capability to act as technical consultant to FmHA on matters dealing with fish and wildlife resources and other environmental analyses, including recommendations for protection and restoration/enhancement of wetlands, floodplain habitats, and coastal barrier resources and for endangered, threatened, and/or candidate species and other fish and wildlife resources for which the Federal Government has national or international management responsibilities. The Service has the expertise to act as advocates for the fish and wildlife resource interest(s) of State or local agencies or private non-profit organizations. In carrying out these responsibilities, the Service will act as liaison between FmHA and State fish and wildlife agencies and non-profit organizations having fish and wildlife conservation as a focus, to ensure that State and private concerns are fully considered.

In addition, the Food Security Act of 1985 (Act) provides important new opportunities for strengthening the farm economy and contributing to fish and wildlife resource conservation and wetlands protection and restoration. Section 1318 of the Act stipulates a role of the Service to assist FmHA in:

(1) selecting real property in which the Secretary (Agriculture) may acquire easements for conservation, recreation, and wildlife purposes;

(2) formulating the terms and conditions of such easements; and

(3) enforcing such easements.

Section 1314 of the Act provides an opportunity for easements, restrictions, development rights, or the equivalent of these items to be granted or sold, for conservation purposes, to units of State or local governments or private non-profit organizations separately from the farm properties in FmHA's inventory.

Therefore, FmHA and the Service agree to coordinate efforts to meet national environmental and farm program objectives through cooperative implementation of the Act, Executive Order 11990, and FmHA's existing environmental planning procedures.

Procedures

I. Loan application processing: In completing environmental analyses associated with farm ownership and other FmHA Farmer Program loans (insured and guaranteed), FmHA will invite assistance from the Service in accordance with 7 CFR Part 1940, Subpart G. To reduce the possibility that Important Resources (Attachment I) may be inadvertently impacted as a result of FmHA loans, the following process will be employed as a part of loan processing actions:

A. the Service will provide FmHA County Offices with periodic updates of appropriate information on Important Resources for inclusion in FmHA's Natural Resource Management Guides;

B. the FmHA County Supervisors will review information provided by the Service in processing Farmer Program loan applications;

C. the FmHA County Supervisor will coordinate with the appropriate field office of the Service if:

(1) there is potential for the Important Resources to be affected through a proposed change in the farm's land use; or

(2) the County Supervisor is unsure regarding the possible presence of threatened, endangered, or candidate species or their habitat;

D. in areas identified by the Service as a high priority for threatened/endangered species and/or migratory birds, especially waterfowl, FmHA County Supervisors will allow the Service the opportunity to provide comments, and will fully consider such comments in developing environmental mitigation measures for individual Farmer Program applications. The Service will identify such areas and will provide such to FmHA as appropriate.

II. Section 1318: It is the intent of both FmHA and the Service to amend this MOU to incorporate consultation procedures for Section 1318 when regulations are finalized and that program becomes effective.

III. Inventory land disposal process, including Section 1314 requests: In completing environmental analyses preparatory to leasing or disposal of inventory properties, including interests in such properties, FmHA will request the Service's assistance. The Service will be afforded the opportunity to provide input and recommendations regarding Important Resources. The Service input, including State agency and private non-profit concerns, will be sought and provided as early as possible in FmHA's suitable/surplus determination process. Whenever Important Resources are identified by the Service, the Service will assist FmHA in the development of lease or deed restrictions consistent with protecting or restoring such resources and the requirements of 7 CFR Part 1940, Subpart G. FmHA will give full consideration to Service recommendations in completion of environmental analyses prior to disposal actions.

Once FmHA has acquired lands through voluntary conveyance or other means, the following process will be employed as part of disposal actions:

A. the FmHA County Supervisors will notify the appropriate field office(s) of the Service of lands currently in inventory and of additional parcels as they are acquired. Notification should include locations, a legal description of the property if available, approximate acreage, and other descriptive information as appropriate (e.g., maps); *

B. the Service will in-turn provide the County Supervisor with assistance in identifying the presence of Important Resources listed in Attachment 1, and if present, with recommended fish and wildlife conservation measures for inclusion in the environmental analysis, suitable/surplus determination process, and subsequent disposal actions;

C. the Service's contribution to FmHA's environmental analysis process will address the following, as appropriate:

(1) existing and potential occurrence and condition of Important Resources on the tract(s);

(2) emergency fish and wildlife conservation measures needed to protect or conserve environmental value(s) of the tract(s);

(3) additional, long-term fish and wildlife conservation measures needed to meet FmHA mandates to conserve, protect, and enhance Important Resources and land uses such as:

(a) the need for wetland protection and enhancement actions in response to Executive Order 11990. In this regard the Service will assist FmHA by identifying important wetland protection opportunities and by formulating and implementing or sponsoring the implementation by a third party (e.g., Ducks Unlimited) of mutually acceptable plans for wetland restoration/enhancement;

(b) recommended lease or deed restrictions needed to protect Important Resources and land uses (e.g., prior to sale the deed would be restricted to protect wetlands or floodplain habitats from conversion to other land uses); or

(c) easements, restrictions, or the equivalent to be considered for grant or sale to units of local or State government or private non-profit organizations for conservation purposes;

(4) identification of management, monitoring and/or enforcement entities for recommended conservation measures, easements, and lease/deed restrictions;

D. when high resource values warrant retention of a property in public ownership, the Service may recommend that FmHA pursue all available avenues to grant or sell easements, restrictions, development rights, or their equivalents to State or local agencies or private non-profit organizations. The Service may also indicate a desire to bid and acquire the property itself should FmHA declare that property surplus and offer it for sale. In order for such recommendations to be feasibly considered by FmHA, the Service field staff will consult with FmHA to gain an understanding of FmHA's property transfer authorities, priorities, and procedures; and

E. Service recommendations will be submitted to, and considered by, the County Supervisor prior to any suitable/surplus determinations, or if such determinations have already been made, they shall be considered upon receipt. For those properties currently in inventory, fish and wildlife conservation measures will be developed prior to resale whenever required by FmHA regulations. Recommendations accepted by FmHA will then be included in subsequent disposal actions.

IV. General: Each agency will designate appropriate field and State Coordinators to implement this Memorandum of Understanding.

A. FmHA County Supervisors will serve as day-to-day field coordinators for lands within their jurisdiction. FmHA State Directors will appoint either the Farmer Programs Chief or State Environmental Coordinator (with the other named as alternate) as the overall FmHA State Coordinator for implementing this document.

B. Service Regional Directors will designate State Coordinator(s) for each State to work directly with FmHA County Supervisors and FmHA State Coordinators to implement this document. The Service State Coordinator will be assisted by designated biologists responsible for field reviews.

C. Within 30 days of the enactment of this Memorandum of Understanding the State Coordinator for each agency will meet to initiate appropriate implementation activities (e.g., establish protocols, identify county contacts, screen existing inventory tracts, prepare for processing new tracts).

D. Timeframes for notification, analyses, reviews, resulting actions and transmittal of comments will conform to FmHA requirements. Telephone responses, followed by written documentation, are acceptable. Unless otherwise mutually agreed to by the Service State Coordinator and the affected County Supervisor, the Service will complete its review and provide a written response for inventory property matters within 45 calendar days from notification of the opportunity to comment. For technical assistance requests involving Farmer Program applications (loan), the Service will respond within 15 days of the request unless FmHA indicates in its request that a guaranteed loan involving an Approved Lender is concerned, in which case the Service will respond within 10 days of the FmHA request (in most cases, this can be handled via telephone response). If the Service does not respond within these timeframes, FmHA may proceed to make any required environmental review and analysis on its own.

Final decisions, including any land disposal actions, shall rest with the FmHA approval official for the action. Resolution of outstanding issues within a State will be at the State Coordinator level and will not incumber the specific action in which the question arises. Unresolved issues and those of a multi-State nature will be addressed at the Regional and/or Washington Office level of the Service and the National Office level of FmHA.

This Memorandum of Understanding is effective immediately upon the last signature date below and will continue in effect until modified or revoked by agreement of both parties, or revoked by either party alone upon 30 days written notice. Modifications to this document may be made by mutual agreement and such modifications will be in effect upon signature of the modified document.

Director,
U.S. Fish and Wildlife Service

5/11/87
Date

Administrator,
Farmers Home Administration

May 14 1987
Date

ATTACHMENT 1

LIST OF IMPORTANT RESOURCES

1. Wetlands, as defined in Executive Order 11990, Protection of Wetlands, and U.S. Department of Agriculture Regulation 9500-3, Land Use Policy.

2. Riparian zones, floodplains, and coastal barriers.

3. Threatened and endangered species (including proposed and candidate), for example:

    (a) critical habitat(s);

    (b) known occurrence (for example — perch sites, feeding area(s) migration stop-over sites, etc.); or

    (c) potential habitat(s) for release, restoration, and/or reintroduction, which would facilitate down listing or diminish the need for listing.

4. Fish and wildlife habitats of local, regional, State or national importance, for example:

    (a) as identified by Congressional Mandate, International Treaty or Management Plans;

    (b) of potential benefit to species of Federal trustee responsibility (e.g., Migratory Birds, Anadromous Fish, Endangered Species); or

    (c) as identified by State or private non-profit organizations.

5. Aquifer recharge areas of local, regional, State or national importance, as identified by Federal or State agencies or private non-profit organizations.

6. Areas of high water quality or scenic value, including wild and scenic rivers and wilderness areas, as identified by Federal or State agencies or private non-profit organizations.

Attachment H

USFWS
MITIGATION POLICY

federal register

Part III

Department of the Interior

Fish and Wildlife Service

U.S. Fish and Wildlife Service Mitigation Policy

[As corrected in the Federal Register of February 4, 1981]

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

U.S. Fish and Wildlife Service Mitigation Policy; Notice of Final Policy

AGENCY: U.S. Fish and Wildlife Service, Department of the Interior.

ACTION: Notice of Final Policy.

SUMMARY: This Notice establishes final policy guidance for U.S. Fish and Wildlife Service personnel involved in making recommendations to protect or conserve fish and wildlife resources. The policy is needed to: (1) ensure consistent and effective Service recommendations; (2) allow Federal and private developers to anticipate Service recommendations and plan for mitigation needs early; and (3) reduce Service and developer conflicts as well as project delays. The intended effect of the policy is to protect and conserve the most important and valuable fish and wildlife resources while facilitating balanced development of the Nation's natural resources.

EFFECTIVE DATE: January 23, 1981.

ADDRESS: Comments submitted on the proposed policy may be inspected in Room 738, 1375 K Street, N.W., Washington, D.C. 20005, between 9 a.m. and 3 p.m. on business days.

FOR FURTHER INFORMATION CONTACT: John Christian, Policy Group Leader—Environment, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240, (202) 343-7151.

SUPPLEMENTARY INFORMATION:

BACKGROUND

The development and use of the Nation's natural resources continues in an effort to provide people with their basic needs and to improve their lives. Fish and wildlife and the intricate fabric of natural resources upon which they depend provide benefits to people in many ways. Fishing, hunting, and bird watching are basic benefits that come to mind immediately. These activities involve the direct use of these renewable "natural resources." Perhaps a greater benefit, although more difficult for some to understand, is the maintenance of the structure and function of the ecosystem that comprises all living species, including people. The presence of diverse, healthy fish and wildlife populations generally signals a healthy ecosystem which contains those elements necessary for human survival, including unpolluted air and productive land.

That fabric of natural resources called habitat is the supply for fish and wildlife renewal. The life requirements for plant and animal species are varied and complex. Each species requires a different set of environmental conditions for survival and vigorous growth. These conditions form the habitat of the various species. The development and use of natural resources leads to changes in environmental conditions that can redefine habitat and thus change the mix and abundance of plant and animal species.

A given change in habitat might increase or decrease overall habitat productivity or result in gains or losses of species that are valuable to people or ecosystems. In some cases, habitat modifications can also increase the numbers of species considered undesirable, and create a nuisance to people or crowd out more valuable species. Therefore, development actions can cause habitat changes that are considered either beneficial or adverse depending on the intended wildlife management objectives.

When professional biologists determine that a given development action will cause a change that is considered adverse, it is appropriate to consider ways to avoid or minimize and compensate for such adverse change or loss of public resources. This is commonly referred to as mitigation.

Fish and wildlife resources are public in nature. The Service has provided Federal leadership for over 40 years to protect and conserve fish and wildlife and their habitat for the benefit of the people of the United States. Under its legal authorities, the Service conducts fish and wildlife impact investigations and provides mitigation recommendations on development projects of all kinds. These efforts have been conducted through a full partnership with State agencies responsible for fish and wildlife resources, and since 1970, with the National Marine Fisheries Service of the U.S. Department of Commerce. The recommendations of the Service are considered by the Federal development and regulatory agencies for their adoption as permitted by law.

Over the years, the Service has reviewed innumerable project and program plans with the potential to adversely affect fish and wildlife resources. The mitigation recommended in recent years by Service personnel to prevent or ameliorate adverse impacts has been governed primarily by a broad policy statement on mitigation promulgated in 1974 and by specific guidelines issued as needed. Recent events have prompted the Service to make known its mitigation objectives and policies. Specific management needs include:

(1) Recent legislative, executive and regulatory developments concerning the environment which have led to a need to update and expand the advice within the 1974 Service policy statement;

(2) Increasing Service review responsibilities which require issuance of comprehensive guidance on mitigation to maintain the quality and consistency of Service mitigation recommendations;

(3) An explicit summary of Service mitigation planning goals and policies to be disclosed to developers and action agencies to aid their earliest planning efforts; and

(4) Finally, the current national need to accelerate development of energy resources which requires that early planning decisions be made that can minimize conflict between important environmental values and energy development.

For these reasons, it was determined to be necessary to fully outline the overall mitigation policy of the U.S. Fish and Wildlife Service. The final Service policy statement integrates and outlines the major aspects of current Service mitigation efforts. Intended as an overview document, its guidance is based on an analysis of current Service field recommendations and on the guidance contained in recent Service management documents.

This policy conditions only the actions of Service employees involved in providing mitigation recommendations. It does not dictate actions or positions that Federal action agencies or individuals must accept. However, it is hoped that the policy will provide a common basis for mitigation decisionmaking and facilitate earlier consideration of fish and wildlife values in project planning activities.

Finally, it should be stressed that this Service policy outlines mitigation needs for fish and wildlife, their habitat and uses thereof. Others interested in mitigation of project impacts on other aspects of the environment such as human health or heritage conservation may find the Service policy does not fully cover their needs. There was no intent to develop a mitigation policy that covers all possible public impacts except those stated. However, the Service strongly believes that preservation and conservation of natural resources is a necessary prerequisite to human existence.

DISCUSSION

The following items are included to provide a better understanding of the policy's relationship to other guidance and to improve the understanding of its technical basis.

1. Relationship of Service Mitigation Policy to Other Service Planning Activities.

The final policy is designed to stand on its own. However, for a clearer perspective of the relationship of the policy to the goals and objectives of the U.S. Fish and Wildlife Service, it can be read with the Service Management Plan and the Habitat Preservation Program Management Document.

The Service Management Plan describes the overall direction of the Service and the interrelationships of the four major categories, including Habitat Preservation, Wildlife Resources, Fishery Resources, and Federal Aid-Endangered Species.

The Habitat Preservation Program Management Document outlines what the Service will do over a one- to five-year period to ensure the conservation and proper management of fish and wildlife habitat. It provides guidance to Service personnel and other interested parties on the goals, objectives, policies, and strategies of the Habitat Preservation Category of the U.S. Fish and Wildlife Service. It includes a discussion of important resource problems that the Service believes require priority attention.

2. Relationship of the Mitigation Policy to any future Fish and Wildlife Coordination Act (FWCA) Regulations and the National Environmental Policy Act (42 U.S.C. 4321–4347) (NEPA).

The Service mitigation policy outlines internal guidance for Service personnel for all investigations and recommendations for mitigation under relevant Service authorities, including the FWCA and NEPA. However, the coverage of the policy is basically different from that of any future FWCA regulations as was explained in the preamble to the proposed policy (September 9, 1980) (45 FR 59486–59494). Any future FWCA regulations will principally recommend procedures for all affected agencies to ensure compliance with that Act before and after they receive fish and wildlife agency recommendations. In contrast, the Service mitigation policy only applies to Service personnel and outlines mitigation planning goals and policies for impact analyses and recommendations.

The relationship of the mitigation policy to NEPA requirements is also a complementary one. The regulations implementing NEPA (43 FR 55978–56007) recognize "appropriate" mitigation recommendations as an important element of the rigorous analysis and display of alternatives including the proposed action (40 CFR Part 1502.14). The NEPA regulations later specify that Service impact analyses and mitigation recommendations shall be used as input to preparation of draft environmental impact statements (DEIS) as follows:

"To the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with environmental impact analyses and related surveys and studies required by the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), the National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.), the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), and other environmental review laws and executive orders." (40 CFR 1502.25(a)).

These provisions provide clear direction that NEPA requirements are not duplicative of or substitute for mitigation recommendations developed under the Fish and Wildlife Coordination Act and other Service authorities. In fact, the NEPA regulations require that Service recommendations be fully integrated into the NEPA process as vital information necessary to comply with NEPA.

3. Focus of the Policy on Habitat Value.

The policy covers impacts to fish and wildlife populations, their habitat and the human uses thereof. However, the primary focus in terms of specific guidance is on the mitigation of losses of habitat value. Population estimates are considered by many to be unreliable indicators for evaluating fish and wildlife impacts. Sampling errors, cyclic fluctuations of populations and the lack of time series data all contribute to the problem. Therefore, the Service feels that habitat value, by measuring carrying capacity, is a much better basis for determining mitigation requirements. However, the use of population information is not foreclosed by the policy. In fact, concern for population losses led to formulation of the "General Policy" section to ". . . seek to mitigate all losses of fish, wildlife, their habitat and uses thereof . . ." The Service agrees that mitigation of population losses is a necessary aspect of this policy, for example, when habitat value is not affected but migration routes are blocked off as in the case of dam construction on a salmon river.

Mitigation of human use losses of fish and wildlife resources is also a necessary aspect of the policy. However, if mitigation of habitat value occurs, then in the majority of cases, losses of human use are also minimized. But, in some cases, public access to the resource may be cut off by the project and significant recreational or commercial benefits may be lost.

In those cases where mitigation of habitat value is not deemed adequate for losses of fish and wildlife populations or human uses, the Service will seek to mitigate such losses in accordance with the general principles and concepts presented in the policy. However, in the majority of cases, the Service feels that mitigation of impacts on habitat values will assure a continuous supply of fish and wildlife populations and human use opportunities.

The Service has recently revised and updated its *Habitat Evaluation Procedures* (HEP). It can be used, where appropriate, to determine mitigation needs based on habitat value losses. In some cases, the project may not be deemed appropriate for applying the methodology as in the case of activities conducted on the high seas under the Outer Continental Shelf (OCS) leasing program. In such cases, the use of other methods to describe habitat value impacts is clearly acceptable, including the best professional judgment of Service biologists. Other limitations related to the use of HEP are outlined in the Ecological Services Manual (100 ESM 1). The HEP are available upon request from the Chief, Division of Ecological Services, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

4. Acre for Acre Loss Replacement Is Not Necessarily Recommended by the Policy.

As explained above, the policy focuses on habitat value. The habitat value of an acre of habitat can vary considerably depending on the type of vegetation and other physical, biological or chemical features. Service recommendations, therefore, will be based on the habitat value adversely impacted, as opposed to strictly acreage. For example, loss of one acre of a specific type of wetland might result in recommendations for replacement of less than one acre of a different type of wetland of greater habitat value. If the habitat value of the wetland available for replacement was equal to that lost, then recommendations could be on an acre-for-acre basis.

5. Rationale for Mitigation Planning Goals.

In developing this policy, it was agreed that the fundamental principles guiding mitigation are: 1) that avoidance or compensation be recommended for the most valued resources; and 2) that the degree of mitigation requested correspond to the value and scarcity of the habitat at risk. Four Resource Categories of decreasing importance were identified, with mitigation planning goals of decreasing stringency developed for these categories. Table 1 summarizes all categories and their goals.

Table 1: Resource Categories and Mitigation Planning Goals

Resource category	Designation criteria	Mitigation planning goal
1	High value for evaluation species and unique and irreplaceable.	No loss of existing habitat value.
2	High value for evaluation species and scarce or becoming scarce.	No net loss of in-kind habitat value.
3	High to medium value for evaluation species and abundant.	No net loss of habitat value while minimizing loss of in-kind habitat value.
4	Medium to low value for evaluation species.	Minimize loss of habitat value.

POLICY HISTORY

The policy statement integrates and outlines the major aspects of current Service mitigation efforts. Intended as an overview document, its guidance is based on an analysis of over 350 Service field recommendations and on the guidance contained in recent Service management documents. The proposed policy was published in the Federal Register on September 9, 1980 (45 FR 59486–59494). A correction notice which corrected insignificant formatting and typographical errors was published on September 19, 1980 (45 FR 62564). A notice extending the comment period on the proposed policy to November 10, 1980, was published on October 8, 1980 (45 FR 66878). The final publication is based on full and thorough consideration of the public comments as discussed below.

RESPONSE TO COMMENTS

Over 90 sets of comments were received on the proposed policy. All comments were thoroughly analyzed and cataloged and considered. Many commentors expressed agreement with Service publication of the policy, sensing a more consistent and predictable Service approach to mitigation recommendations and a resultant decrease in the degree of conflict with developers. Many felt the policy represented a rational approach to fish and wildlife resource management, and that it would provide for adequate protection and conservation of the Nation's fish and wildlife resources. The underlying concept that the degree of mitigation requested should correspond to the importance and scarcity of the habitat at risk was also supported by many commentors. Numerous commentors also praised its scope, cohesiveness and clarity, and stressed that it should provide valuable guidance for Government personnel providing technical and project planning assistance.

Detailed responses to significant comments follow:

GENERAL COMMENTS ON THE PROPOSED SERVICE MITIGATION POLICY

Comment: Although the Service prepared an Environmental Assessment and, from its findings, concluded that policy issuance did not constitute a major Federal action which would significantly affect the quality of the human environment within the meaning of Section 102(2)(C) of the National Environmental Policy Act (NEPA), a few commentors disagreed with the Service's conclusion that an Environmental Impact Statement (EIS) was not necessary for the proposed action.

Response: During policy development, the Service took action to determine if preparation of an environmental impact statement under NEPA was required. Although section 1508.18 of the Council on Environmental Quality's (CEQ) Regulations for implementing the procedural provisions of NEPA classified adoption of an official policy as a "Federal action," it remained unclear as to whether this action was "major," or whether it would "significantly" affect the quality of the human environment, since policy implementation would not result in or substantially alter agency programs. As was stated in the preamble, this policy is basically a distillation of approaches and policy currently being practiced by Service field personnel in providing mitigation recommendations.

In order to resolve this uncertainty, an Environmental Assessment was prepared for the proposed and final policy. By doing so, the Service has complied with one of the major purposes of the NEPA regulations, which is to have NEPA applied early in the decisionmaking process.

The NEPA regulations do not, in the opinion of the Service, require that the agency speculate on future, possible events without any relation to actual, existing impacts of an action. Section 1502.2 of the NEPA regulations directs that an EIS is to be analytical, however, the Service action simply does not create any impacts capable of such analysis. Thus, there is no reasonable or scientific way for the Service to analyze any environmental impacts, significant or otherwise, as discussed in §§ 1502.16 and 1508.27.

This problem is particularly vexsome when those impacts depend on future contingencies and can be more appropriately analyzed when those contingencies occur. Even § 1502.4, which discussed EIS's in terms of broad agency actions, does so in the context of specific impacts caused by the action. In the opinion of the Service, it has fully complied with the letter and spirit of NEPA and its regulations.

Comment: One commentor felt that the preamble statement that an EIS would be premature at this time contradicted a finding of no significant impact.

Response: The Service sees no contradiction with a finding of no significant impact and the statement that an EIS is premature. The finding of no significant impact derives from an analysis showing that the policy has no significant impacts amenable to analysis at the present time. However, when in the future the Service does apply the policy in developing mitigation recommendations for a major Federal action which might significantly affect the quality of the human environment, then the environmental impacts associated with implementing those recommendations which are considered justifiable by the development agency can be analyzed by that development agency. The Service has no way of predicting which of its recommendations will be accepted by the developer; therefore, analysis of impacts of accepted mitigation recommendations is the responsibility of the developer.

Comment: One commentor was of the opinion that an EIS "should be prepared for the Service's proposed mitigation recommendations on each project." Moreover, the commentor felt that a significant portion of these EIS's should be devoted to analysis of economic impacts.

Response: Mitigation recommendations and actions cannot be meaningfully analyzed except in the context of the development action initiating them. And, since an EIS would be required for any major Federal action which would significantly affect the quality of the human environment and whose alternatives would include consideration of mitigation, a separate EIS would not be necessary for mitigation actions.

Under the FWCA, the action agency which makes the ultimate decision is to include all "justifiable mitigation means and measures" in project formulation. The burden of analyzing the economic impacts of "justifiable" mitigation measures therefore rests primarily with the project sponsor, who will likely use the Water Resources Council's Principles and Standards to assist in the analysis.

Comment: The substantive requirements of the Service mitigation policy should be consistent with the requirements of the National Environmental Policy Act's implementing regulations and the Water Resources Council's Principles and Standards.

Response: We agree. The proposed and final policy have been developed consistent with the substantive and procedural requirements of these regulations.

Comment: The Environmental Assessment identifies as one of the advantages of the proposed mitigation policy the establishment of "* * * minimum performance standards for FWS recommendations (which) would serve as benchmarks by which the FWS and developers or action agencies * * * could assess individual Service mitigation proposals." However, neither the Federal Register notice nor the Environmental Assessment identify or discuss these "benchmarks."

Response: The term "benchmarks" referred to the mitigation goals and planning procedures. Both the proposed policy preamble and its Environmental Assessment discussed these guidelines, explaining their derivation and importance to policy purposes. However, a point of clarification is needed regarding these guidelines. It is the recommendations made by Service personnel that would be measured against these standards, not the mitigation implemented by an action agency. The final policy makes this point explicit.

Comment: Many commentors argued that the proposed policy goes beyond that authorized by law. Specific concern was expressed over the use of words that were mandatory in tone (e.g., "require" and "must") as opposed to advisory. In addition, some commented that the Service has no authority to support or oppose projects as stated in the policy.

Response: The Service agrees that the legal authorities for the mitigation policy do not authorize the Service to exercise veto power over land and water development activities. That understanding was implicit in the proposed policy. Appropriate changes have been made in the policy to more explicitly recognize and signify the advisory nature of the Service responsibility.

However, it should be clearly noted that the Fish and Wildlife Coordination Act places clear mandatory requirements on Federal development agencies falling under that Act's authority to (1) consult with the Service, National Marine Fisheries Service (NMFS) and State agencies responsible for fish and wildlife resources; (2) incorporate such reports and recommendations in one overall project report; (3) provide "full consideration" of the "reports and recommendations;" (4) include in the project plan "such justifiable means and measures for wildlife purposes as the reporting agency finds should be adopted to obtain overall maximum project benefits;" and (5) other requirements related to funding and land acquisition.

The clear intent of Congress was that recommendations developed by the U.S. Fish and Wildlife Service, NMFS, and State agencies responsible for fish and wildlife resources be taken seriously, and we know of no law which prohibits the Service from taking a position for or against a project when making mitigation recommendations.

Comment: The policy will adversely impact developmental interests.

Response: The goal of the policy is to provide for equal consideration of fish and wildlife conservation while facilitating development.

Congress has clearly stated that "wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs" (Pub. L. 85-624, Fish and Wildlife Coordination Act). This advice is further amplified in Senate Report 1981 on the FWCA (84th Congress, 2nd Session (1958)). The Congress recognized that in some instances, the level of dollar benefits to some purposes might have to be diminished "in some slight degree" in order to accomplish the fish and wildlife conservation objectives of the Act.

However, policy issuance should benefit developmental interests. By providing developers with a clear picture of Service mitigation concerns and priorities, the policy will allow developers to anticipate Service mitigation recommendations prior to final decisions on project design and location. By reducing a developer's planning uncertainties, the policy will result in lowered project costs and fewer project delays and conflicts.

Comment: Does the policy present general guidance or minimum required standards? The Service appears to be trying to establish required standards.

Response: The final policy sets out mitigation goals and planning guidance to guide the development of Service mitigation recommendations. It does not require absolute strict adherence to a required standard. Changes have been made to reflect this.

Comment: No mention is made of the State role in mitigation planning to assure a compatible approach. The States' authorities and decisionmaking prerogatives with respect to fish and wildlife resources should be denoted and the States' roles in mitigation should be emphasized further.

Response: A compatible approach is desirable. We have included appropriate changes. However, the policy is solely for Service personnel. There is no intent to infringe on the States' prerogatives.

Comment: The policy should require full public disclosure of Service mitigation analyses, determinations, and recommendations.

Response: We agree that full disclosure of Service analyses, determinations and recommendations during the mitigation process would serve the public interest. All public documents associated with Service recommendations for mitigation on specific land and water developments are available for review in Ecological Services field offices. No change in the policy is necessary.

Comment: The Service should specifically address the acid rain problem in its policy. In particular, the policy should address the impact of Federal policies and programs that support power plant conversions to coal.

Response: The Service currently reviews such Federal actions under NEPA, since these policies and programs are likely to require an EIS. Because acid rain has been highlighted as an Important Resource Problem (IRP) by the Service, environmental analyses which do not adequately address acid rain problems will receive particular attention by Service reviewers. Our comments will be technically reinforced by Service research already being conducted in this area. Since the policy already covers this issue, no change is necessary.

Comment: Could the mitigation policy call for a recommendation as extreme as reflooding of the Mississippi River Valley?

Response: The mitigation policy would not lead to so extreme a recommendation because it does not apply to development actions completed prior to enactment of Service authorities or exempted by those authorities. In those situations where the policy does apply, there will be no recommendations for mitigation over and above the level of impacts associated with a project. This policy acts to minimize impacts of projects, not reverse them.

Comment: Which agency enforces this policy and what power does it have?

Response: This is a policy that applies only to Service personnel. It does not predetermine the actions of other Federal agencies, nor the actions of State agencies or developers. Although the policy statement is not judicially enforceable, the Service will administer the policy by monitoring the mitigation recommendations made by its own personnel.

Comment: Too often land acquired for mitigation does not provide the spectrum of resource values previously available because the managing agency's philosophy prevents it from managing the land for a mix of goals.

Response: Lands acquired for mitigation purposes must provide the specific mitigation benefits for which they were intended. Secondary land uses, such as provision of timber, oil and gas exploration, or recreational benefits, should be attempted where these uses are compatible with the mitigation lands' primary purpose. This concept has been added to the policy.

SPECIFIC COMMENTS ON THE MITIGATION POLICY

(These comments are keyed to sections of the proposed policy.)

I. Purpose

Comment: Why is this policy apparently unconcerned with flora?

Response: Mitigating for fish and wildlife losses necessarily means dealing with the plant communities on which all animal life indirectly depends. When habitat is preserved, it is the plant communities that are the vast bulk of the living material of that habitat.

Plants *per se* are addressed by other authorities of the Service which are not within the scope of this policy, such as the Endangered Species Act and associated regulations.

II. Authority

No significant comments.

III. Scope

Comment: How does the policy affect projects already completed or under construction?

Response: Appropriate changes in the Scope section have been made to clarify policy coverage with regard to completed projects or projects under construction.

Comment: Since Federal permit renewals will result in no new effects on the environment, they should be exempt from the policy.

Response: The permit or license renewal process provides an opportunity to re-evaluate the project. Depending on new scientific information concerning impacts, the adequacy of past developer mitigation efforts, or new authorities, new mitigation recommendations may be necessary.

Not infrequently, permit or license holders use the renewal process as a convenient occasion to seek changes in their permits. Any changes in permit or license holders' activities have to be evaluated to determine whether or not they necessitate new mitigation recommendations.

This policy, therefore, will be used by the Service in permit or license renewal proceedings, keeping in mind that Service recommendations are advisory to action agencies. Appropriate changes were made in the policy to reflect this position.

Comment: Does this policy apply to man-induced wetlands?

Response: Where the Service has the authority and responsibility to recommend mitigation for these habitats, the tenets of the policy shall apply.

Comment: There is a need for a mechanism for evaluating enhancement and a means to differentiate it from mitigation.

Response: Although enhancement is an important concern of the Service, the Service mitigation policy should not serve as the primary vehicle for discussing enhancement. The final policy does differentiate between enhancement and mitigation recommendations by defining enhancement to include measures which would improve fish and wildlife resources beyond that which would exist without the project and which cannot be used to satisfy the appropriate mitigation planning goal. As for evaluating enhancement, it would appear likely that many of the procedures that can be used to evaluate mitigation can be used to evaluate enhancement.

Comment: What is the basis for the policy position that enhancement cannot occur until all losses are compensated? There is no legislative history for this.

Response: Unfortunately, the term "enhancement" suffers from wide differences in semantic usage. The proposed policy used the term to be synonymous with improvements beyond the achievement of full mitigation. This strict interpretation appeared to spark controversy.

The final policy incorporates a different usage of the term. Enhancement is used to describe measures not necessary to accomplish mitigation purposes.

Comment: The policy should credit towards mitigation goals those habitat value increases associated with areas of the habitat which are enhanced by the project. Habitat value should be computed for enhancement activities, and the inclusion of habitat enhancement factors would provide for a more accurate estimate of the project's impact on the environment.

Response: Use of the term "habitat enhancement" to describe development or improvement efforts is confused by this comment. The mitigation policy does not cover enhancement as we have described it. However, where habitat improvement or development caused by a project will result in habitat value increases, it may be considered as mitigation when consistent with the resource category designation criteria and the appropriate mitigation planning goal.

Comment: There should be a clear statement that all opportunities for enhancement of fish and wildlife resources be thoroughly considered and included in project plans to the extent feasible.

Response: We agree. Appropriate changes were made.

IV. Definition of Mitigation

Comment: Some commentors indicated concern over the definition of mitigation as used in the policy. Specific concern was expressed that those aspects of project planning that include avoidance or actions to minimize impacts should be considered good project planning and that mitigation should be confined solely to actions to compensate for resource losses.

Response: The Service agrees that avoidance or actions to minimize impacts should be part of the early design of projects and not just an afterthought. Some consider mitigation to be a separate and distinct process that occurs after project planning has been completed. The legally binding definition of mitigation as used in the regulations to implement the National Environmental Policy Act (NEPA) can have the effect of altering this notion through incorporation of all those actions that can lessen project impacts throughout the planning process.

The policy has been modified to more clearly state that the Service supports and encourages incorporation of features that will reduce adverse impacts on fish and wildlife resources as part of early planning and project design in order to avoid delays or conflicts. But without the emphasis on avoidance and minimization provided by the NEPA regulations' definition, there would be little incentive for development agencies to incorporate such features. The Service, therefore, supports and adopts that definition.

V. Mitigation Policy of the U.S. Fish and Wildlife Service

Comment: A number of documents are referred to in the draft policy. They are essential to the functioning of the policy and should be published as an appendix and otherwise made available for public comment, including public hearings.

Response: The preamble to the proposed policy clearly indicated that the policy was designed to stand on its own. The referenced documents are not essential to the functioning of the policy. For instance, even though Service field personnel will rely basically on the *Habitat Evaluation Procedures* in conducting project analyses, the policy indicates that other methods can be used where appropriate and available. The concept of habitat value has been recognized throughout the history of fish and wildlife management. It is not new.

Regardless of the fact that the policy stands on its own, the referenced documents have undergone varying degrees of public scrutiny independent of the mitigation policy. For instance, a notice of availability and request for public comment was published in the Federal Register for the Service Management Plan and Program Management Document on September 29, 1980 (45 FR 64271–64272). A habitat-based evaluation methodology has been under active development in the Service since 1973. The first document officially called the *Habitat Evaluation Procedures* was published in 1976 with the most recent revision in 1980. During this 7 year period, the Nation's top wildlife biologists have been consulted, both within the government and outside. The procedures have been presented at numerous public conferences and have been the subject of intense scrutiny.

Finally, the referenced documents were made available to reviewers. Over 75 requests were made and immediately filled to allow commentors the full benefit of this information in preparing comments, including the group providing this comment. Minor changes were made in the policy to more clearly indicate that the policy can stand on its own.

A. General Principles

Comment: Pursued to its logical conclusion, the concept of fish and wildlife as public trust resources could lead to serious restrictions on the use and management of private lands.

Response: When the concept of personal property rights is exercised in such a way as to jeopardize the interests of the public in fish and wildlife resources on public or private lands, the government may use its authorities to see that any damage to those interests is prevented or mitigated.

The Service does and will attempt to fulfill its duties within its authorities and in a reasonable manner. It is certainly cognizant of the fact that pursuing any concept to its logical extreme may lead to unreasonableness, and will continue to strive to prevent this from happening in its mitigation activities.

Comment: What does "equal consideration" of wildlife conservation mean within the context of the Fish and Wildlife Coordination Act and this mitigation policy?

Response: "Equal consideration" was not defined in the Act or this policy, and has no particular meaning in the context of this policy. This policy only covers Service recommendations, not action agency requirements.

Comment: The proposed Service policy now absolutely precludes support for non-water dependent projects within or affecting waters of the United States. This should be modified to conform to the requirements of Federal regulatory agencies such as the Army Corps of Engineers (COE) and the Environmental Protection Agency (EPA).

Response: The Service policy clearly does not exercise veto power over development actions. Moreover, the Service will execute its responsibilities fully within the context of existing laws and regulations governing environmental reviews. However, the Service feels that wetlands and shallow water habitats should not be subjected to *needless* development because of the public values of these areas. The Service policy statement does not include water dependency as the "sole" criterion for its recommendations. Other factors, including the likelihood of a significant loss, are considered prior to a Service recommendation for support of a project or the "no project" alternative.

The provisions of the policy have been modified to make such recommendations discretionary.

Comment: Congress, not the Service, is the entity that has the authority to require and fund compensation for Federal projects.

Response: We agree. The policy has been modified.

Comment: Mitigation should not be required for an indefinite period of time.

Response: Mitigation is appropriate for the entire time period that habitat losses persist, which includes the life of the project and as long afterwards as the impacts of the project continue to exist. The policy reflects this position.

Comment: Under "General Principles," the policy should seek and endorse novel or imaginative approaches to mitigation.

Response: The Service fully supports development of novel and imaginative approaches that mitigate losses of fish and wildlife, their habitat, and uses thereof, and has been in the forefront of such development. No change is necessary.

Comment: An Indian tribe strongly supports the Department of the Interior's recognition of the role of Indian tribal governments in mitigation planning.

Response: Our national heritage and, in some cases, the livelihood of Indian tribes, can be directly linked with the conservation and use of fish and wildlife resources. Therefore, the U.S. Fish and Wildlife Service will continue to recognize and support Indian tribal governments' efforts to mitigate impacts on these resources.

B. U.S. Fish and Wildlife Service Mitigation Goals by Resource Category

Comment: The mitigation goals for the resource categories were characterized as: reasonable, too strict, or not strict enough.

Response: As was explained in the preamble to the draft policy, the resource categories and their mitigation goals were abstracted from an analysis of actual field recommendations. The designation criteria for the resource categories (replaceability, scarcity, and value for evaluation species) are the basic decision factors used by Service personnel to assess relative mitigation needs. The mitigation goals represent reasonable mitigation expectations for projects, viewed in the light of our two-faceted goal—(1) to conserve, protect and enhance fish and wildlife and their habitats, and (2) to facilitate balanced development of our Nation's natural resources.

Numerous comments were received commending us on the balanced approach embodied in this policy. Since its tenets derive from field recommendations and comments, the credit belongs entirely to our field staff.

Some commentors criticized the mitigation goals. One group felt that one or several of the mitigation goals were too strict. These commentors objected to what they considered to be unreasonably high goals for fish and wildlife mitigation. In contrast to this first group, another set of commentors felt that the goals were not strict enough, and called attention to our legislative responsibility to seek protection for all fish and wildlife resources.

Our response is that the mitigation goals represent the best professional judgment and cumulative experience of Service field supervisors in developing mitigation proposals that would satisfy our legislative mandates, operate under time and money constraints, and assist in maximizing overall social well-being. The basic concept, therefore, is unchanged in the final policy, although minor changes were made to improve understanding based on the comments.

Comment: Rather than rely on strict inflexible mitigation goals, the Service should use "tradeoff" evaluation procedures in developing mitigation proposals.

Response: It is the responsibility of the Federal action agency to use tradeoff evaluation procedures consistent with the Water Resources Council's Principles and Standards, where applicable, to select a mitigation alternative that will assist in maximizing overall project benefits. The Fish and Wildlife Coordination Act specifies that "the project plan shall include such justifiable means and measures for wildlife purposes as the *reporting agency* (emphasis added) finds should be adopted to obtain maximum overall project benefits." The role of the Service is to represent those public trust resources under its jurisdiction. The proposed policy outlined a system wherein the highest valued resources would be subject to the most protective mitigation recommendations. Few, if any, commentors have disagreed with this valuation perspective. Therefore, no changes were made.

However, many commentors have questioned the reasonableness of a seemingly uncompromising system that did not appear to allow occasional deviations from these goals.

The system is not rigid. As stated in the Purpose section of the policy, the policy advice will be used as guidance for Service personnel, but variations appropriate to individual circumstances are permitted.

Comment: Numerous commentors raised the issue of the somewhat subjective nature of identifying certain species as "important" for the purposes of the policy. In addition, commentors indicated that such distinctions could lead to mis-classification of habitats in terms of resource categories and that clear criteria were needed. Finally, many commentors felt that the artificial distinction of certain species as "important" was both a violation of the public trust and Service legal authorities.

Response: People perceive some species to be more important than others. In the context of biology and ecology, all species are important, serving a useful purpose within the confines of their biological niche. The mitigation policy must address *both* the needs and desires of human society *and* the ecosystem perspective. This is a difficult task. But human decisions concerning fish and wildlife resources in the face of a development action require judgment about the values of what will be lost and the need to avoid or minimize and compensate for loss of such values.

The specific criteria for such determinations are also exceedingly difficult to frame in a National policy context. The importance of a species to society depends on a complex, changing mix of factors. The importance of a species within an ecosystem is also subject to many dynamic factors. But human decisions about the level and type of mitigation necessary for development actions must be made in the absence of perfect information concerning these factors. In addition, the Service biologist reviewing project impacts has severe constraints on the number of species and ecosystem linkages that can be analyzed given funding, personnel and time limitations. Somehow, choices must be made.

We have deleted the term "important species" from the policy and replaced it with a more precise term, "evaluation species." The criteria for selection of evaluation species still includes those species of high resource value to humans or that represent a broader ecological perspective of an area. Other changes have been made related to the determination of resource categories to allow for additional public input and resource agency coordination into such determinations, where appropriate.

The effect of this change is not intended and shall not be interpreted to broaden the scope or extent of application of this policy. But it does remove the implication that species can be ranked against each other in terms of their overall importance to society, which many considered quite beyond the capability of human beings.

Comment: The wording of the policy should clearly indicate that species selected for analysis should only be those demonstrated to actually utilize an area.

Response: We agree, except for situations where fish and wildlife restoration or improvement plans have been approved by State or Federal resource agencies. In that case the analysis will include species identified in such plans. Appropriate clarification has been added to the definition of evaluation species.

Comment: The proper focus of the policy should be the ecosystem rather than particular species.

Response: Aside from the very real technical problems of applying a complex concept such as the ecosystem to mitigation planning, the authorities underlying this policy deal with fish and wildlife and their habitat, rather than ecosystems.

Ecosystems are addressed under this policy in two ways. First, one criterion in the selection of an evaluation species is the biological importance of the species to the functioning of its ecosystem. Secondly, when habitat loss is mitigated, the part of the ecosystem comprising that habitat is itself protected. No changes have been made.

Comment: Recreational use losses may at times have to be directly mitigated. The goal statements should reflect this need.

Response: We agree. Appropriate changes were made.

Comment: In addition to assessing conditions of scarcity from a biogeographical viewpoint, i.e., ecoregions, the policy should also use geopolitical subdivisions, e.g., state boundaries.

Response: As a Federal agency, the Service perceives its major responsibility to be to protect those fish and wildlife and their habitat that are valuable and scarce on a national level, whether or not they transcend state boundaries. However, should State resource agencies wish to outline relative scarcity on a more local basis, Service personnel would certainly assist, whenever practicable. This point has been added to the policy.

Comment: The policy should scale the relative need to achieve a particular mitigation goal to the degree a particular habitat will be impacted. For example, if a half-acre of important habitat is affected by a project and it is part of a one-acre plot, this circumstance should lead to a mitigation recommendation different from the situation where the same half-acre is part of a ten thousand acre area. As drafted, the policy does not reflect the differences in these situations.

Response: The Purpose section of the policy states that it will be used as guidance for Service personnel, but variations appropriate to individual circumstances will be permitted. The relative need to achieve a particular mitigation goal depends primarily on the perceived value of the habitat, its scarcity, and the replaceability of the threatened habitat. Other factors, such as scaling considerations, can combine to modify this general Service perspective on what constitutes appropriate mitigation.

Comment: The resource categories and mitigation goals are general, lack definition, and provide no guidance on habitat value. These categories are all subject to interpretation by the Service field personnel.

Response: It would be counterproductive, if not impossible, for a national policy to be worded as precisely as the commentor suggests and still be implemented in a reasonable manner under numerous and diverse local circumstances. Words used to describe resource categories and mitigation goals do have generally understood meanings. It is essential that field personnel be allowed to exercise professional judgment in applying resource categories and mitigation goals to specific activities. However, numerous clarifying changes were made based on the comments to increase comprehension and understanding.

Comment: It is essential to other agencies' review to know what general types of habitat will be most important in the U.S. Fish and Wildlife Service mitigation policy. At a minimum, some examples of the types of habitat within each category should be given.

Response: The final policy does give guidance on areas that will be generally considered for Resource Category 1 or 2. Providing examples for all resource categories could be misleading since the same type of habitat may fall into several different resource categories, depending on, among other factors, its relative scarcity and quality from one locale to another across the nation.

On the other hand, field professionals are generally familiar with the quality and abundance of a given type of habitat that is in their area, so it is preferable not to burden them with potentially inappropriate guidelines of this nature.

Comment: The policy should clearly distinguish between upland habitats and the more valuable wetland habitats.

Response: In some cases, upland habitats may be determined to have resource values equal to or greater than wetland habitats, so a policy that solely favored one habitat type over the other would not be in the best public interest. However, the policy has been changed to indicate that certain habitats within Service-identified Important Resource Problems (IRPs) and special aquatic sites should be given special consideration as Resource Category 1 or 2. The IRPs contain a predominance of wetland coastal areas.

Comment: If you build something in a habitat, it just changes it to another habitat that some other animal or fish lives in—including the human being, although the Service does not seem to appreciate that. For example, if you build a highway, it is bad for dogs, rabbits, opossums and field rats and such that get run over by cars and trucks, but it is good for crows and buzzards that eat dead meat.

Response: The Service has not come across many instances where crows and buzzards could be considered scarce, but when such a circumstance can be documented and verified, the Service will certainly try to protect and enhance valuable highway habitat.

- *Resource Category 1*

Comment: A literal interpretation of the Resource Category 1 mitigation goal would require absolutely no habitat loss—not even a nature trail. Resource Category 1 should be deleted.

Response: Not all environmental changes are adverse to the habitat of a fish and wildlife resource. If a nature trail resulted in an insignificant impact on habitat value that was determined not to be adverse, then the Service would not recommend against it. The policy has been clarified to reflect this point.

Comment: Endangered and threatened species should be included as part of Resource Category 1.

Response: It would be inappropriate to expand the scope of the Mitigation Policy to include threatened and endangered species. The treatment of these species is addressed in an extensive body of complex and detailed legislation and regulation. The Congress has legislated very specific and precise law with regard to threatened and endangered species. Inclusion of these species under this policy would only confuse the issue and compound the difficulties involved in implementation of the Endangered Species Act and its associated regulations. Other reasons are discussed in the scope section of the final policy.

Comment: For all practical purposes, Resource Categories 1 and 2 adopt a "no growth" policy.

Response: The U.S. Fish and Wildlife Service is not advocating a "no growth" mitigation policy. The means and measures to achieve mitigation for Resource Categories 1 and 2 are designed to provide some flexibility so that limited growth can occur in an environmentally prudent manner. The policy reflects the national consensus that some habitats are of exceptional public value and should be carefully conserved, as evidenced in the Wild and Scenic Rivers Act (Pub. L. 90–542), the Wilderness Act (Pub. L. 88–577), and the National Trails System Act (Pub. L. 94–527).

- *Resource Category 2*

Comment: It is ill-advised to support in-kind replacement involving trading habitat for lesser value habitat which is then improved to support the species affected by the project. It takes too long, and in the meantime, populations supported by the habitat on the project site are lost.

Response: If the period required for improving the replacement habitat to the appropriate condition was exceedingly long, this may be one indication that the habitat at risk was unique or irreplaceable and actually belonged in Resource Category 1. In that case in-kind replacement through improvement of lesser quality habitat would be an inappropriate mitigation recommendation. Also, additional measures aimed at population restoration could be recommended to restock the area, provided suitable habitat was available to support the stocked species. No changes were made.

Comment: One commenter was perturbed by an apparently rigid insistence by the policy of in-kind replacement of lost habitat. The commentor pointed out that there could be occasions in which in-kind habitat was not available to a project sponsor.

Response: The policy guideline for Resource Category 2 includes an exception when "* * * in-kind replacement is not physically or biologically attainable". No change was necessary.

Comment: The policy appears to insist upon "acre-for-acre" replacement of in-kind habitat.

Response: The policy does not insist on "acre-for-acre" replacement of in-kind habitat. The mitigation planning goals involving in-kind replacement specifically ask for replacement of in-kind habitat *value*. This point has been further clarified in the definitions section, throughout the policy, and in the policy preamble.

- *Resource Category 3*

Comment: The mitigation goal for Resource Category 3 is not authorized by law and will be difficult to implement due to professional disagreement on satisfactory achievement.

Response: Under the Fish and Wildlife Coordination Act, the Service has the responsibility to recommend compensation for the loss of fish and wildlife resources. The Act does not restrict compensation to in-kind compensation. By recommending out-of-kind compensation under certain circumstances, the Service increases the range of options that developers may use to mitigate project impacts to include development and improvement of marginal resources different from those lost. However, modifications have been made in the policy to indicate that in-kind replacement is preferred for Resource Category 3.

Comment: The mitigation goal for Resource Category 3 should emphasize that in-kind habitat value replacement is preferable to out-of-kind replacement.

Response: We agree. This point has been brought out in the final policy statement.

Comment: Although out-of-kind replacement is acceptable for Resource Category 3 losses and, under certain circumstances, may be accepted for Resource Category 2 losses, the policy should advise against replacement of rare habitat types for more common habitat types.

Response: We agree with the commentor's point and expect that Service field personnel will recommend mitigation alternatives that incorporate this concept, to the extent practicable. The Service is entirely in favor of preserving and/or promoting habitat diversity. No changes were necessary.

- *Resource Categories 4 and 5*

Comment: Compensation should be included as a means for satisfying the mitigation goal for Resource Category 4.

Response: Appropriate language changes have been made to allow for such recommendations.

Comment: Habitats encompassed by Resource Categories 4 and 5 are the only areas wherein significant increases in fish and wildlife can be realized through habitat improvement. Yet, the mitigation goals for these categories allow continual loss of these areas which possess great potential for improvements in carrying capacity.

Response: The Service appreciates the significance of areas with relatively low existing habitat values with respect to their potential for carrying capacity improvements. In fact, the Service may recommend improvement of these areas' habitat values to mitigate for unavoidable losses in Resource Categories 2 and 3. In addition, where these areas are included in a project planning area and are not appropriate for mitigation efforts, the Service will recommend that all opportunities for enhancement of these areas be thoroughly considered and included in project plans, where practicable.

We have amended the policy to include the above guidance.

Comment: Resource Category 5 is confusing and unnecessary. All habitat has some value, no matter how low. It should be redefined or deleted.

Response: We agree. This resource category has been deleted from the final policy.

C. Mitigation Planning Procedures

1. *Mitigation Goals*

Comment: Developers, Federal resource agencies, and the public should participate with the Service and State agencies in making Resource Category determinations and in developing mitigation proposals.

Response: Developers, as well as other members of the public, may provide information that will assist the Service in making Resource Category determinations. This opportunity has been noted in the final policy statement. Moreover, where these parties' inputs will significantly aid in development of mitigation proposals that will adequately satisfy mitigation planning goals, the Service will welcome their input.

Comment: It is hoped that reclassification of habitats in Resource Category 3 to Resource Categories 2 or 1 can be readily employed if and when certain habitats become more scarce.

Response: Resource Category determinations are made on the basis of conditions likely to occur without the project. If those conditions later change, the Resource Category of a given habitat can be redetermined.

However, once a mitigation plan in connection with a given project has been agreed upon, the U.S. Fish and Wildlife Service will not provide new or additional recommendations except under limited circumstances as outlined in the policy under the scope section.

2. *Impact Assessment Methods*

Comment: The policy does not appear to recognize that development activities may also show positive environmental effects. For example, cleared spaces beneath power lines can provide browsing areas for wildlife. Such positive effects should be factored into the mitigation assessment process.

Response: We agree. This point has been included in the final policy statement. The final policy further indicates that the Service and other State and Federal resource agencies shall make the determination of whether a biological change constitutes a beneficial or adverse impact. However, when determining mitigation needs for a planning area, the Service will utilize these policy guidelines to determine whether these positive effects can be applied towards mitigation.

Comment: The draft policy indicates "no net loss" as a goal for certain Resource Categories but it is unclear in defining the time period allowed to restore the land to its original value as in the case of strip mining operations. Maintenance of "no net loss" throughout the life of a long-term operation is not possible.

Response: The policy states that the net biological impact of a specific project proposal is the difference in predicted habitat value between the future with the action and the future without the action. This is based on the procedures established by the Water Resources Council's Principles and Standards. The future with the project determination includes consideration of losses during the life of the project. Under the policy, if the disturbed habitat is of sufficient value for evaluation species to warrant a Resource Category 2 or 3 level determination, the Service will provide recommendations for "no net loss" over the life of the project. The ability of the project sponsor to achieve this goal depends on many factors that cannot be predicted in advance. In many cases, it will be possible to achieve this goal. No change was necessary.

Comment: The with and without analyses should make allowances for human activities and natural species successions which can reasonably be expected to take place in the project area.

Response: We agree. Appropriate changes have been made in this policy.

Comment: Many commentors disagreed with the emphasis placed on the *Habitat Evaluation Procedures* (HEP) within the Service policy statement. Some commentors felt it should be de-emphasized, whereas others felt it deserved further emphasis.

Response: Although references to the more technical aspects of HEP have been deleted, the methodology itself remains one of the Service's more important impact assessment tools. The policy does not recommend exclusive use of HEP, since time or resource contraints may, in some cases, show alternative methods to be more practical. Where HEP habitat value assessments do not fully capture important biological characteristics within a planning area, Service personnel will use supplemental data, methodologies, and/or professional judgment to develop appropriate mitigation proposals.

Comment: What are the "other habitat evaluation systems" alluded to in the policy's section on impact assessment methods? This reference is very vague.

Response: Other systems can include the Habitat Evaluation System (HES) developed by the Department of the Army, and the Instream Flow Incremental Methodology (IFIM) of the U.S. Fish and Wildlife Service. Additional systems are referenced by the Water Resources Council in a draft document entitled, "Analysis of

Wetland Evaluation Procedures" and other publications. This information is not appropriate for inclusion into the policy so no change was made.

Comment: If other methodologies are found to be more appropriate for use than the Instream Flow Incremental Methodology (IFIM) for measuring flow impacts, they should be used.

Response: We agree. The final policy does state, however, that consideration should be given to the use of the IFIM.

Comment: Hopefully, this policy will stop the piecemeal destruction of valuable habitat, especially in areas like the Florida Keys where insidious lot-by-lot development continues in low wetland sites with the concurrence of the U.S. Fish and Wildlife Service.

Response: The Service does not concur with piecemeal development where significant resource losses will occur. Cumulative impacts are addressed by this policy. The Service is sensitive to this loss of habitat and will seek mitigation consistent with this policy. No change was necessary.

Comment: Population information should be included as an additional factor in determining mitigation requirements.

Response: We agree. Although population mitigation was an implicit part of the proposed policy, further language clarifying this point has been added to the final policy statement.

Comment: Professional judgment should be used as an alternative method for assessing project impacts.

Response: We agree that this is a valuable method that has been in use for many years. It is difficult to improve on informed and considered scientific judgment by an expert. The Service will continue to rely heavily on this approach. The policy was changed to reflect this emphasis.

3. *Mitigation Recommendations*

Comment: Service recommendations should be timely.

Response: The proposed and final policy specifically require Service personnel to present mitigation recommendations "* * * at the earliest possible stage of project planning to assure maximum consideration." This point has been echoed throughout Service management documents. Service personnel can generally provide timely guidance provided developers make a point of notifying them of proposed projects still in the planning stage and provided Federal action agencies supply sufficient transfer funding with which to conduct environmental investigations. Under Section 2(e) of the Fish and Wildlife Coordination Act, Federal action agencies are authorized to transfer funds to the Service "* * * as may be necessary to conduct all or part of the investigations required to carry out the purposes of * * * (Section 2 of the Act)." The Service uses these transfer funds to conduct project-specific investigations.

Comment: Requiring field biologists to consider cost-effectiveness in providing mitigation recommendations is beyond their capability and may conflict with the lead agencies' role as the determiner of overall public interest. Habitat protection should be a higher priority than cost-effectiveness.

Response: The proposed policy did not require a cost-effectiveness analysis by Service biologists in a formal sense. We fully agree that Service personnel must perceive their responsibility to be analysis and recommendations based on the biological aspects of project proposals. There is no intent to require Service biologists to do a formal economic analysis for which they are not trained nor for which there is clear legislative direction. However, the Service has a responsibility to the public to give consideration to cost while recommending ways to conserve fish and wildlife. The policy has been changed to reflect this need for consideration of other factors.

Comment: The Federal action agency should have the option of non-Service expertise to develop mitigation measures in those instances where the Service cannot meet lead agency program requirements.

Response: Although the Service cannot prevent other agencies from utilizing biological expertise from non-Federal sources to develop mitigation plans, the Fish and Wildlife Coordination Act specifically authorizes the Secretary of the Interior to prepare a report and recommendations on the fish and wildlife aspects of projects, including mitigation. This report and recommendations are to receive "full consideration" by the development agency. If the Federal action agency involves the Service early and provides sufficient transfer funds, then the Service should be able to meet their needs. No change in the policy was necessary.

Comment: Several mitigation proposals should be prepared for each alternative structural or non-structural plan.

Response: The Service is willing to prepare multiple proposals provided funds and time are available.

Comment: Some commentors felt that concurrent and proportionate funding of mitigation may not always lead to optimal mitigation and should not be a rigid requirement. Other commentors strongly supported concurrent and proportionate funding.

Response: The Water Resources Council's Principles and Standards require "* * * *at least* concurrent and proportionate implementation with other major project features, except where such concurrent and proportionate mitigation is physically impossible" (emphasis added).

We agree with the Council, and endorse expenditure of funds at an earlier stage of project planning when this will lead to more effective mitigation. Appropriate changes to the policy on this matter have been made.

Comment: Mitigation costs should include the cost of managing the acquired land for the life of the project, and the value of present and future timber and crops on acquired land. In addition, an environmental benefit/cost analysis should be developed for each project, and Congress should not authorize a project unless the project plan includes the proposed mitigation program and all its costs, including the cost of lost timber productivity and other resources.

Response: Costing of projects is determined by the Water Resource Council's Principles and Standards and is therefore beyond the jurisdiction of this policy. We point out that Service policy does not preclude timber harvest or other resource recovery operations on mitigation lands when the activity is compatible with fish and wildlife management objectives.

Comment: The Service mitigation policy should more clearly note that fee-simple land acquisition should be a measure of last resort.

Response: The policy statement has undergone further modification to more clearly stress the conditions when land acquisition is to be recommended by Service personnel. In the future, the Service will place far greater emphasis on developing mitigation recommendations that avoid, minimize, or rectify impacts in order to reduce the need for compensation lands. Amplification of this point may be seen in the section on mitigation planning procedures.

Comment: If some interest in land must be acquired, areas of marginal productivity should be considered first. Such underdeveloped land would benefit from better management of its productive capacity and respond more vigorously than land already at higher levels of production.

Response: We agree that special consideration should be given to marginal lands, and have changed the policy accordingly.

Comment: Who owns land acquired for mitigation purposes?

Response: Depending on the individual circumstances of the project, land acquired through fee-simple title is usually owned either by the Federal or State government and administered by appropriate Federal or State resource agencies. Where wildlife easements are acquired, the land belongs to the property owner, and the easement right to the Federal or State government.

Comment: The policy should require Service personnel to identify the authority to be used in implementing any mitigation recommendations that are made.

Response: The final policy clearly identifies the legal authorities under which the Service is expected to develop mitigation recommendations. In addition, the policy only applies to Service recommendations and is not an instrument directing legal research in individual circumstances. It would be inappropriate to instruct our personnel to identify the implementing authority for the development agencies which are fully aware of the authorities available to implement Service recommendations. In the case of projects to be authorized by Congress, authorities to implement mitigation can be, and increasingly have been, spelled out.

Comment: The policy neglects to indicate the necessary process if an agency does not agree with Service mitigation recommendations.

Response: This process has already been established for most Federal agencies. If the project planners and the Service field office cannot agree on a modified or substitute proposal for mitigation, the matter often is referred upwards to the next highest level. Higher management levels are then generally able to resolve the issue quickly, although the Federal action agency has the final say. No change was necessary.

Comment: Mitigation recommendations should ensure that habitats which are preserved are adequate in size and contiguous to ensure species survival and ecosystem functioning.

Response: We agree. This point has not, however, been added to the policy since it is standard operating procedure at the field level.

Comment: Improvement of public use prospects within a project area should not be considered mitigation for habitat value losses. Development of public access is legitimate mitigation only when public uses are lost as a result of project action.

Response: We agree. Construction of public access facilities does not replace habitat lost or degraded and may even reduce wildlife habitat and invite degradation by making an area more accessible to more people. Construction of public use facilities may be in the public interest but should not be disguised as mitigation for loss or degradation of wildlife habitat. This point has been added to the policy.

4. *Follow-up*

Comment: The Service should initiate post-project evaluation studies, as well as encourage, support, and participate in these studies.

Response: We agree and will do so within the constraints of time, personnel and cost. The Service will initiate additional follow-up studies when funds are provided by the Federal action agency. The policy has been changed to reflect this.

Comment: Follow-up studies must be designed so as to separate the effects on fish and wildlife populations of implementing mitigation recommendations from other causes of changes in species numbers. This has not been the case in past studies.

Response: We agree in principle, but point out that this is a very difficult task technically, and that the conclusions in this regard rarely withstand vigorous analysis.

Nonetheless, distinguishing the true causes of population changes should be one of the goals of the follow-up study.

Comment: The policy should indicate what actions would occur if post-project evaluation shows mitigation recommendations are not being achieved as agreed to by the developer.

Response: We agree. The policy now includes provisions instructing Service personnel to recommend corrective action in such situations.

Appendix A

No significant comments.

Appendix B

Comment: Why not include more intensive management of remaining habitat as a way of reducing net habitat loss?

Response: We agree, and have modified the policy accordingly in the Means and Measures section, which has since been integrated into the body of the final policy.

The section clearly places priority on increased habitat management as a means of replacing habitat losses, and additionally stresses use of existing public lands to accomplish these ends.

Comment: A mitigation recommendation of "No project" is not logical or valid as a mitigation measure.

Response: The Council on Environmental Quality's definition of mitigation, which has been adopted in this policy, clearly states that mitigation includes ". . . avoiding the impact altogether by not taking a certain action or parts of an action. . . ." Obviously, a mitigation recommendation of "No project" falls under this subset of the definition, since a project's impact can be avoided *altogether* by a decision not to construct a project.

Appendix C

Comment: The definition of the word "practicable" should be amended to denote that the burden of identifying alternative mitigation measures and of conducting a searching inquiry into their practicability rests with the Service as well as the Federal action agency.

Response: The policy indicates that the Service will strive to provide mitigation recommendations that represent the best judgment of the Service on the most effective means and measures to achieve the mitigation goal, including consideration of cost.

Comment: A definition for "developments" (as used in Section V.A., "General Principles") should be provided in Appendix C.

Response: "Development" is a general-purpose term encompassing those activities falling under the scope of Service mitigation authorities cited within this policy. For example, if timber harvesting activities require preparation of an EIS, or involves waters of the U.S. and requires the issuance of a Federal permit or license, the Service would provide mitigation recommendations consistent with the policy.

NATIONAL ENVIRONMENTAL POLICY ACT REQUIREMENTS

The Service has prepared an Environmental Assessment of this final policy. Based on an analysis of the Environmental Assessment, the Director of the U.S. Fish and Wildlife Service has concluded that the final action is not a major Federal action which would significantly affect the quality of the human environment within the meaning of Section 102(2)(c) of the National Environmental Policy Act of 1969 (42 U.S.C. 4321–4347). Thus the policy does not require an Environmental Impact Statement (EIS).

The Environmental Assessment and Finding of No Significant Impact will be furnished upon request.

REGULATORY ANALYSIS

This policy statement has been issued in conformity with the Department of the Interior's rulemaking requirements, which apply to actions meeting the broad definition of a rule set forth in the Administrative Procedures Act, 5 U.S.C.

551(4) and 43 CFR Part 14.2(e) (1980). This statement is not intended to be judicially enforceable. It will not be codified. It does not create private rights. It only guides internal Service administration and is not to be inflexibly applied by Service personnel. The Department had previously determined that the proposed policy was not a significant rule and did not require a regulatory analysis under Executive Order 12044 and 43 Part 14. No significant changes were made in the final policy that required a new determination.

ACKNOWLEDGEMENTS

The primary author of this final policy is John Christian, Leader, Policy Group—Environment, U.S. Fish and Wildlife Service, (202) 343-7151. Primary support for policy development was provided by policy analysts Nancy Chu, Scott Cameron, and Peter Ciborowski; and Ecological Services Washington Office and field personnel. Manuscript preparation was accomplished by Roberta Hissey, Karen Baker, Carol Prescott, and Jinethel Baynes.

Accordingly, the mitigation policy of the U.S. Fish and Wildlife Service is set forth as follows:

U.S. FISH AND WILDLIFE SERVICE MITIGATION POLICY

I. PURPOSE

This document establishes policy for U.S. Fish and Wildlife Service recommendations on mitigating the adverse impacts of land and water developments on fish, wildlife, their habitats, and uses thereof. It will help to assure consistent and effective recommendations by outlining policy for the levels of mitigation needed and the various methods for accomplishing mitigation. It will allow Federal action agencies and private developers to anticipate Service recommendations and plan for mitigation measures early, thus avoiding delays and assuring equal consideration of fish and wildlife resources with other project features and purposes. This policy provides guidance for Service personnel but variations appropriate to individual circumstances are permitted.

This policy supersedes the December 18, 1974, policy statement entitled "Position Paper of the Fish and Wildlife Service Relative to Losses to Fish and Wildlife Habitat Caused by Federally Planned or Constructed Water Resource Developments" and the Service River Basin Studies Manual Release 2.350 entitled "General Bureau Policy on River Basin Studies."

II. AUTHORITY

This policy is established in accordance with the following major authorities: (See Appendix A for other authorities.)

Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)–754). This Act authorizes the development and distribution of fish and wildlife information to the public, Congress, and the President, and the development of policies and procedures that are necessary and desirable to carry out the laws relating to fish and wildlife including: (1) ". . . take such steps as may be required for the development, advancement, management, conservation, and protection of the fisheries resources;" and (2) ". . . take such steps as may be required for the development, management, advancement, conservation, and protection of wildlife resources through research . . . and other means."

Fish and Wildlife Coordination Act (16 U.S.C. 661–667(e)). This Act authorizes the U.S. Fish and Wildlife Service, National Marine Fisheries Service (NMFS), and State agencies responsible for fish and wildlife resources to investigate all proposed Federal undertakings and non-Federal actions needing a Federal permit or license which would impound, divert, deepen, or otherwise control or modify a stream or other body of water and to make mitigation and enhancement recommendations to the involved Federal agency. "Recommendations . . . shall be as specific as practicable with respect to features recommended for wildlife conservation and development, lands to be utilized or acquired for such purposes, the results expected, and shall describe the damage to wildlife attributable to the project and the measures proposed for mitigating or compensating for these damages." In addition, the Act requires that wildlife conservation be coordinated with other features of water resource development programs.

Determinations under this authority for specific projects located in estuarine areas constitute compliance with the provisions of the Estuary Protection Act. (See Appendix A.)

Watershed Protection and Flood Prevention Act (16 U.S.C. 1001–1009). This Act allows the Secretary of the Interior to make surveys, investigations, and ". . . prepare a report with recommendations concerning the conservation and development of wildlife resources . . ." on small watershed projects.

National Environmental Policy Act of 1969 (42 U.S.C. 4321–4347). This Act and its implementing regulations (40 CFR Part 1500–1508) requires that the U.S. Fish and Wildlife Service be notified of all major Federal actions affecting fish and wildlife resources and their views and recommendations solicited. Upon completion of a draft Environmental Impact Statement, the Service is required to review it and make comments and recommendations, as appropriate. In addition, the Act provides that "the Congress authorizes and directs that, to the fullest extent possible . . . all agencies of the Federal Government shall . . . identify and develop methods and procedures . . . which will ensure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations."

III. SCOPE

A. Coverage

This policy applies to all activities of the Service related to the evaluation of impacts of land and water developments and the subsequent recommendations to mitigate those adverse impacts except as specifically excluded below. This includes: (1) investigations and recommendations for all actions requiring a federally issued permit or license that would impact waters of the U.S.; (2) all major Federal actions significantly affecting the quality of the human environment; and (3) other Federal actions for which the Service has legislative authority or executive direction for involvement including, but not limited to: coal, minerals, and outer continental shelf lease sales or Federal approval of State permit programs for the control of discharges of dredged or fill material.

B. Exclusions

This policy does not apply to threatened or endangered species. The requirements for threatened and endangered species are covered in the Endangered Species Act of 1973 and accompanying regulations at 50 CFR Parts 17, 402, and 424. Under Section 7 of the Endangered Species Act, as amended, all Federal agencies shall ensure that activities authorized, funded, or carried out by them are not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. Mitigating adverse impacts of a project would not in itself be viewed as satisfactory agency compliance with Section 7. Furthermore, it is clear to the Service that Congress considered the traditional concept of mitigation to be inappropriate for Federal activities impacting listed species or their critical habitat.

This policy does not apply to Service recommendations for Federal projects completed or other projects permitted or licensed prior to enactment of Service authorities (unless indicated otherwise in a specific statute) or specifically exempted by them and not subject to reauthorization or renewal. It also does not apply where mitigation plans have already been agreed to by the Service, except where new activities or changes in current activities would result in new impacts or where new authorities, new scientific information, or developer failure to implement agreed upon recommendations make it necessary. Service personnel involved in land and water development investigations will make a judgment as to the applicability of the policy for mitigation plans under development and not yet agreed upon as of the date of final publication of this policy.

Finally, this policy does not apply to Service recommendations related to the enhancement of fish and wildlife resources. Recommendations for measures which improve fish and wildlife resources beyond that which would exist without the project and which cannot be used to satisfy the appropriate mitigation planning goal should be considered as enhancement measures. The Service strongly supports enhancement of fish and wildlife resources. The Service will recommend that all opportunities for fish and wildlife resource enhancement be thoroughly considered and included in project plans, to the extent practicable.

IV. DEFINITION OF MITIGATION

The President's Council on Environmental Quality defined the term "mitigation" in the National Environmental Policy Act regulations to include: "(a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments." (40 CFR Part 1508.20(a–e)).

The Service supports and adopts this definition of mitigation and considers the specific elements to represent the desirable sequence of steps in the mitigation planning process. (See Appendix B for definitions of other important terms necessary to understand this policy.)

V. MITIGATION POLICY OF THE U.S. FISH AND WILDLIFE SERVICE

The overall goals and objectives of the Service are outlined in the Service Management Plan and an accompanying Important Resource Problems document which describes specific fish and wildlife problems of importance for planning purposes. Goals and objectives for Service activities related to land and water development are contained in the Habitat Preservation Program Management Document. The mitigation policy was designed to stand on its own; however, these documents will be consulted by Service personnel to provide the proper perspective for the Service mitigation policy. They are available upon request from the Director, U.S. Fish and Wildlife Service, Washington, D.C. 20240.

A. General Policy

The mission of the U.S. Fish and Wildlife Service is to:

PROVIDE THE FEDERAL LEADERSHIP TO CONSERVE, PROTECT AND ENHANCE FISH AND WILDLIFE AND THEIR HABITATS FOR THE CONTINUING BENEFIT OF THE PEOPLE.

The goal of Service activities oriented toward land and water development responds to Congressional direction that fish and wildlife resource conservation receive equal consideration and be coordinated with other features of Federal resource development and regulatory programs through effective and harmonious planning, development, maintenance and coordination of fish and wildlife resource conservation and rehabilitation in the United States, its territories and possessions. The goal is to:

CONSERVE, PROTECT AND ENHANCE FISH AND WILDLIFE AND THEIR HABITATS AND FACILITATE BALANCED DEVELOPMENT OF THIS NATION'S NATURAL RESOURCES BY TIMELY AND EFFECTIVE PROVISION OF FISH AND WILDLIFE INFORMATION AND RECOMMENDATIONS.

Fish and wildlife and their habitats are public resources with clear commercial, recreational, social, and ecological value to the Nation. They are conserved and managed for the people by State, Federal and Indian tribal Governments. If land or water developments are proposed which may reduce or eliminate the public benefits that are provided by such natural resources, then State and Federal resource agencies and Indian tribal agencies have a responsibility to recommend means and measures to mitigate such losses. Accordingly:

IN THE INTEREST OF SERVING THE PUBLIC, IT IS THE POLICY OF THE U.S. FISH AND WILDLIFE SERVICE TO SEEK TO MITIGATE LOSSES OF FISH, WILDLIFE, THEIR HABITATS, AND USES THEREOF FROM LAND AND WATER DEVELOPMENTS.

In administering this policy, the Service will strive to provide information and recommendations that fully support the Nation's need for fish and wildlife resource conservation as well as sound economic and social development through balanced multiple use of the Nation's natural resources. The Service will actively seek to facilitate needed development and avoid conflicts and delays through early involvement in land and water development planning activities in advance of proposals for specific projects or during the early planning and design stage of specific projects.

This should include early identification of resource areas containing high and low habitat values for important species and the development of ecological design information that outlines specific practicable means and measures for avoiding or minimizing impacts. The former can be used by developers to site projects in the least valuable areas. This could possibly lower total project costs to development interests. These actions are part of good planning and are in the best public interest.

The early provision of information to private and public agencies in a form which enables them to avoid or minimize fish and wildlife losses as a part of initial project design is the preferred form of fish and wildlife conservation.

B. U.S. Fish and Wildlife Service Mitigation Planning Goals by Resource Category

The planning goals and guidelines that follow will be used to guide Service recommendations on mitigation of project impacts. Four Resource Categories are used to indicate that the level of mitigation recommended will be consistent with the fish and wildlife resource values involved.

The policy covers impacts to fish and wildlife populations, their habitat and the human uses thereof. However, the primary focus in terms of specific guidance is on recommendations related to habitat value losses. In many cases, compensation of habitat value losses should result in replacement of fish and wildlife populations and human uses. But where it does not, the Service will recommend appropriate additional means and measures.

RESOURCE CATEGORY 1

a. Designation Criteria

Habitat to be impacted is of high value for evaluation species and is unique and irreplaceable on a national basis or in the ecoregion section.

b. Mitigation Goal

No Loss of Existing Habitat Value.

c. Guideline

The Service will recommend that all losses of existing habitat be prevented as these one-of-a-kind areas cannot be replaced. Insignificant changes that do not result in adverse impacts on habitat value may be acceptable provided they will have no significant cumulative impact.

RESOURCE CATEGORY 2

a. Designation Criteria

Habitat to be impacted is of high value for evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section.

b. Mitigation Goal

No Net Loss of In-Kind Habitat Value.

c. Guideline

The Service will recommend ways to avoid or minimize losses. If losses are likely to occur, then the Service will recommend ways to immediately rectify them or reduce or eliminate them over time. If losses remain likely to occur, then the Service will recommend that those losses be compensated by replacement of the same kind of habitat value so that the total loss of such in-kind habitat value will be eliminated.

Specific ways to achieve this planning goal include: (1) physical modification of replacement habitat to convert it to the same type lost; (2) restoration or rehabilitation of previously altered habitat; (3) increased management of similar replacement habitat so that the in-kind value of the lost habitat is replaced, or (4) a combination of these measures. By replacing habitat value losses with similar habitat values, populations of species associated with that habitat may remain relatively stable in the area over time. This is generally referred to as in-kind replacement.

Exceptions: An exception can be made to this planning goal when: (1) different habitats and species available for replacement are determined to be of greater value than those lost, *or* (2) in-kind replacement is not physically or biologically attainable in the ecoregion section. In either case, replacement involving different habitat kinds may be recommended provided that the total value of the habitat lost is recommended for replacement (see the guideline for Category 3 mitigation below).

RESOURCE CATEGORY 3

a. Designation Criteria

Habitat to be impacted is of high to medium value for evaluation species and is relatively abundant on a national basis.

b. Mitigation Goal

No Net Loss of Habitat Value While Minimizing Loss of In-Kind Habitat Value.

c. Guideline

The Service will recommend ways to avoid or minimize losses. If losses are likely to occur, then the Service will recommend ways to immediately rectify them or reduce or eliminate them over time. If losses remain likely to occur, then the Service will recommend that those losses be compensated by replacement of habitat value so that the total loss of habitat value will be eliminated.

It is preferable, in most cases, to recommend ways to replace such habitat value losses in-kind. However, if the Service determines that in-kind replacement is not desirable or possible, then other specific ways to achieve this planning goal include: (1) substituting different kinds of habitats, or (2) increasing management of different replacement habitats so that the value of the lost habitat is replaced. By replacing habitat value losses with different habitats or increasing management of different habitats, populations of species will be different, depending on the ecological attributes of the replacement habitat. This will result in no net loss of total habitat value, but may result in significant differences in fish and wildlife populations. This is generally referred to as out-of-kind replacement.

RESOURCE CATEGORY 4

a. Designation Criteria

Habitat to be impacted is of medium to low value for evaluation species.

b. Mitigation Goal

Minimize Loss of Habitat Value.

c. Guideline

The Service will recommend ways to avoid or minimize losses. If losses are likely to occur, then the Service will recommend ways to immediately rectify them or reduce or eliminate them over time. If losses remain likely to occur, then the Service may make a recommendation for compensation, depending on the significance of the potential loss.

However, because these areas possess relatively low habitat values, they will likely exhibit the greatest potential for significant habitat value improvements. Service personnel will fully investigate these areas' potential for improvement, since they could be used to mitigate Resource Category 2 and 3 losses.

C. Mitigation Planning Policies

1. State-Federal Partnership

a. The U.S. Fish and Wildlife Service will fully coordinate activities with those State agencies responsible for fish and wildlife resources, the National Marine Fisheries Service (NMFS) and the Environmental Protection Agency (EPA) related to the investigation of project proposals and development of mitigation recommendations for resources of concern to the State, NMFS or EPA.

b. Service personnel will place special emphasis on working with State agencies responsible for fish and wildlife resources, NMFS and EPA to develop compatible approaches and to avoid duplication of efforts.

2. Resource Category Determinations

a. The Service will make Resource Category determinations as part of the mitigation planning process. Such determinations will be made early in the planning process and transmitted to the Federal action agency or private developer to aid them in their project planning, to the extent practicable.

b. Resource Category determinations will be made through consultation and coordination with State agencies responsible for fish and wildlife resources and other Federal resource agencies, particularly the National Marine Fisheries Service and the Environmental Protection Agency, whenever resources of concern to those groups are involved. Where other elements of the public, including development groups, have information that can assist in making such determinations, the Service will welcome such information.

c. All Resource Category determinations will contain a technical rationale consistent with the designation criteria. The rationale will: (1) outline the reasons why the evaluation species were selected; (2) discuss the value of the habitat to the evaluation species; and (3) discuss and contrast the relative scarcity of the fish and wildlife resource on a national and ecoregion section basis.

Note.—If the State agency responsible for fish and wildlife resources wishes to outline scarcity on a more local basis, U.S. Fish and Wildlife Service personnel should assist in developing such rationale, whenever practicable.

d. When funding, personnel, and available information make it practicable, specific geographic areas or, alternatively, specific habitat types that comprise a given Resource Category should be designated in advance of development. Priority for predesignation will be placed on those areas that are of high value for evaluation species and are subject to development pressure in the near future. Such predesignations can be used by developers or regulators to determine the least valuable areas for use in project planning and siting considerations.

e. The following examples should be given special consideration as either Resource Category 1 or 2:

(1) Certain habitats within Service-identified Important Resource Problem (IRP) areas. Those IRPs dealing with threatened or endangered species are not covered by this policy. (See Scope)

(2) Special aquatic and terrestrial sites including legally designated or set-aside

areas such as sanctuaries, fish and wildlife management areas, hatcheries, and refuges, and other aquatic sites such as floodplains, wetlands, mudflats, vegetated shallows, coral reefs, riffles and pools, and springs and seeps.

3. Impact Assessment Principles

a. Changes in fish and wildlife productivity or ecosystem structure and function may not result in a biologically adverse impact. The determination as to whether a biological change constitutes an adverse impact for which mitigation should be recommended is the responsibility of the Service and other involved Federal and State resource agencies.

b. The net biological impact of a development proposal (or alternatives) is the difference in predicted biological conditions between the future with the action and the future without the action. If the future without the action cannot be reasonably predicted and documented by the project sponsor, then the Service analysis should be based on biological conditions that would be expected to exist over the planning period due to natural species succession or implementation of approved restoration/improvement plans or conditions which currently exist in the planning area.

c. Service review of project impacts will consider, whenever practicable:

(1) The total long-term biological impact of the project, including any secondary or indirect impacts regardless of location; and (2) any cumulative effects when viewed in the context of existing or anticipated projects.

d. The *Habitat Evaluation Procedures* will be used by the Service as a basic tool for evaluating project impacts and as a basis for formulating subsequent recommendations for mitigation subject to the exemptions in the Ecological Services Manual (100 ESM 1). When the *Habitat Evaluation Procedures* do not apply, then other evaluation systems may be used provided such use conforms with policies provided herein.

e. In those cases where instream flows are an important determinant of habitat value, consideration should be given to the use of the Service's Instream Flow Incremental Methodology to develop instream flow mitigation recommendations, where appropriate.

f. Where specific impact evaluation methods or mitigation technologies are not available, Service employees shall continue to apply their best professional judgment to develop mitigation recommendations.

4. Mitigation Recommendations

a. The Service may recommend support of projects or other proposals when the following criteria are met:

(1) They are ecologically sound;

(2) The least environmentally damaging reasonable alternative is selected;

(3) Every reasonable effort is made to avoid or minimize damage or loss of fish and wildlife resources and uses;

(4) All important recommended means and measures have been adopted with guaranteed implementation to satisfactorily compensate for unavoidable damage or loss consistent with the appropriate mitigation goal; and

(5) For wetlands and shallow water habitats, the proposed activity is clearly water dependent and there is a demonstrated public need.

The Service may recommend the "no project" alternative for those projects or other proposals that do not meet all of the above criteria and where there is likely to be a significant fish and wildlife resource loss.

b. Recommendations will be presented by the Service at the earliest possible stage of project planning to assure maximum consideration. The Service will strive to provide mitigation recommendations that represent the best judgment of the Service, including consideration of cost, on the most effective means and measures of satisfactorily achieving the mitigation planning goal. Such recommendations will be developed in cooperation with the Federal action agency or private developer responsible for the project, whenever practicable, and will place heavy reliance on cost estimates provided by that Federal action agency or private developer.

c. The Service will recommend that the Federal action agency include designated funds for all fish and wildlife resource mitigation (including, but not limited to, Service investigation costs, initial development costs and continuing operation, maintenance, replacement, and administrative costs) as part of the initial and any alternative project plans and that mitigation funds (as authorized and appropriated by Congress for Federal projects) be spent concurrently and proportionately with overall project construction and operation funds throughout the life of the project.

Note.—Prevention of losses may necessitate expenditure of funds at an earlier stage of project planning. This is acceptable and preferred.

d. Service mitigation recommendations will be made under an explicit expectation that these means and measures: (1) would be the ultimate responsibility of the appropriate Federal action agency to implement or enforce; and (2) would provide for a duration of effectiveness for the life of the project plus such additional time required for the adverse effects of an abandoned project to cease to occur.

e. Land acquisition in fee title for the purpose of compensation will be recommended by the Service *only* under one or more of the following three conditions:

(1) When a change in ownership is necessary to guarantee the future conservation of the fish and wildlife resource consistent with the mitigation goal for the specific project area; *or*

(2) When other means and measures for mitigation (see Section 5 below) will not compensate habitat losses consistent with the mitigation goal for the specific project area; *or*

(3) When land acquisition in fee title is the most cost-effective means that may partially or completely achieve the mitigation goal for the specific project area.

Service recommendations for fee title land acquisition will seek to identify mitigation lands with marginal economic potential.

f. First priority will be given to recommendation of a mitigation site within the planning area. Second priority will be given to recommendation of a mitigation site in proximity to the planning area within the same ecoregion section. Third priority will be given to recommendation of a mitigation site elsewhere within the same ecoregion section.

g. Service personnel will fully support a variety of uses on mitigation lands where such uses are compatible with dominant fish and wildlife uses and, for Federal wildlife refuges, are consistent with the provisions of the Refuge Recreation Act and the National Wildlife Refuge Administration Act. However, it may be in the best public interest to recommend limiting certain uses that would significantly decrease habitat value for species of high public interest. In such cases, the Service may recommend against such incompatible uses.

h. Measures to increase recreation values will not be recommended by Service personnel to compensate for losses of habitat value. Recreation use losses not restored through habitat value mitigation will be addressed through separate and distinct recommended measures to offset those specific losses.

i. The guidelines contained in this policy do not apply to threatened or endangered species. However, where both habitat and endangered or threatened species impacts are involved, Service personnel shall fully coordinate Environment efforts with Endangered Species efforts to provide timely, consistent, and unified recommendations for resolution of fish and wildlife impacts, to the extent possible. More specifically, Environment and Endangered Species personnel shall coordinate all related activities dealing with investigations of land and water developments. This includes full use of all provisions that can expedite Service achievement of "one-stop shopping," including coordinated early planning involvement, shared permit review activities, consolidated permit reporting, and consolidated flow of pre-project information to developers, consistent with legislative mandates and deadlines.

j. The Service will place high priority on and continue to develop and implement procedures for reducing delays and conflicts in permit related activities. Such procedures will include, but not be limited to:

(1) Joint processing of permits.

(2) Resource mapping.

(3) Early provision of ecological design information.

(4) Involvement in Special Area Management Planning.

k. The Service will encourage predevelopment compensation actions by Federal action agencies which can be used to offset future unavoidable losses for lands or waters not adequately protected by an existing law, policy, or program.

Banking of habitat value for the express purpose of compensation for unavoidable future losses will be considered to be a mitigation measure and not an enhancement measure. Withdrawals from the mitigation "bank" to offset future unavoidable losses will be based on habitat value replacement, not acreage or cost for land purchase and management.

5. Mitigation Means and Measures

Mitigation recommendations can include, but are not limited to, the types of actions presented below. These means and measures are presented in the general order and priority in which they should be recommended by Service personnel with the exception of the "no project" alternative. (See Section 4(a)).

a. Avoid the impact

(1) Design project to avoid damage or loss of fish and wildlife resources including management practices such as timing of activities or structural features such as multiple outlets, passage or avoidance structures and water pollution control facilities.

(2) Use of nonstructural alternative to proposed project.

(3) No project.

b. Minimize the impact

(1) Include conservation of fish and wildlife as an authorized purpose of Federal projects.

(2) Locate at the least environmentally damaging site.

(3) Reduce the size of the project.

(4) Schedule timing and control of initial construction operations and subsequent operation and maintenance to minimize disruption of biological community structure and function.

(5) Selective tree clearing or other habitat manipulation.

(6) Control water pollution through best management practices.

(7) Time and control flow diversions and releases.

(8) Maintain public access.

(9) Control public access for recreational or commercial purposes.

(10) Control domestic livestock use.

c. Rectify the impact

(1) Regrade disturbed areas to contours which provide optimal fish and wildlife habitat or approximate original contours.

(2) Seed, fertilize and treat areas as necessary to restore fish and wildlife resources.

(3) Plant shrubs and trees and other vegetation to speed recovery.

(4) Control polluted spoil areas.

(5) Restock fish and wildlife resources in repaired areas. Fish stocking or introductions will be consistent with the Service Fish Health Policy (January 3, 1978).

d. Reduce or eliminate the impact over time

(1) Provide periodic monitoring of mitigation features to assure continuous operation.

(2) Assure proper training of project personnel in the operations of the facility to preserve existing or restored fish and wildlife resources at project sites.

(3) Maintain or replace equipment or structures so that future loss of fish and wildlife resources due to equipment or structure failure does not occur.

e. Compensate for impacts

(1) Conduct wildlife management activities to increase habitat values of existing areas, with project lands and nearby public lands receiving priority.

(2) Conduct habitat construction activities to fully restore or rehabilitate previously altered habitat or modify existing habitat suited to evaluation species for the purpose of completely offsetting habitat value losses.

(3) Build fishery propagation facilities.

(4) Arrange legislative set-aside or protective designation for public lands.

(5) Provide buffer zones.

(6) Lease habitat.

(7) Acquire wildlife easements.

(8) Acquire water rights.

(9) Acquire land in fee title.

6. Follow-up

The Service encourages, supports, and will initiate, whenever practicable, post-project evaluations to determine the effectiveness of recommendations in achieving the mitigation planning goal. The Service will initiate additional follow-up studies when funds are provided by the Federal action agency.

In those instances where Service personnel determine that Federal agencies or private developers have not carried out those agreed upon mitigation means and measures, then the Service will request the responsible Federal action agency to initiate corrective action.

APPENDIX A—OTHER AUTHORITIES AND DIRECTION FOR SERVICE MITIGATION RECOMMENDATIONS

LEGISLATIVE

Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.). The 1977 amendments require the Fish and Wildlife Service ". . . upon request of the Governor of a State, and without reimbursement, to provide technical assistance to such State in developing a Statewide (water quality planning) program and in implementing such program after its approval." In addition, this Act requires the Service to comment on proposed State permit programs for the control of discharges of dredged or fill material and to comment on all Federal permits within 90 days of receipt.

Federal Power Act of 1920, as amended (16 U.S.C. 791(a), 803, 811). This Act authorizes the Secretary of the Interior to impose conditions on licenses issued for hydroelectric projects within specific withdrawn public lands. The Secretary is given specific authority to prescribe fishways to be constructed, maintained, and operated at the licensee's expense.

Estuary Protection Act (16 U.S.C. 1221–1226). This Act requires the Secretary of the Interior to review all project plans and reports for land and water resource development affecting estuaries and to make recommendations for conservation, protection, and enhancement.

Coastal Zone Management Act of 1972 (16 U.S.C. 1451–1464). This Act requires the Secretary of Commerce to obtain the views of Federal agencies affected by the program, including the Department of the Interior, and to ensure that these views have been given adequate consideration before approval of Coastal Zone Management Plans. The Service provides the Department's views about fish and wildlife resources. Pursuant to the Coastal Zone Management Act Amendments of 1980 (Pub. L. 96-464) the Department of Interior provides comments on Federal grants to help States protect and preserve coastal areas because of their ". . . conservational, recreational, ecological or aesthetic values." The 1980 Amendments also authorize the Department of Interior to enter into Special Area Management Planning to ". . . provide for increased specificity in protecting natural resources, reasonable coast dependent economic growth . . . and improved predictability in government decisionmaking."

Water Bank Act (16 U.S.C. 1301-1311). This Act requires that the Secretary of Agriculture ". . . shall consult with the Secretary of Interior and take appropriate measures to insure that the program carried out . . . is in harmony with wetlands programs administered by the Secretary of the Interior."

Wild and Scenic Rivers Act (16 U.S.C. 1271-1287). This Act requires the Secretary of the Interior to comment on such proposals. The Fish and Wildlife Service provides the Department's views with regard to fish and wildlife resources.

Geothermal Steam Act of 1970 (30 U.S.C. 1001-1025). This Act requires that the Fish and Wildlife Service recommend to the Secretary those lands that shall not be leased for geothermal development by reason of their status as ". . . a fish hatchery administered by the Secretary, wildlife refuge, wildlife range, game range, wildlife management area, waterfowl production area, or for lands acquired or reserved for the protection and conservation of fish and wildlife that are threatened with extinction."

Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.). This Act requires the Department of the Interior to regulate surface mining and reclamation at existing and future mining areas. The Fish and Wildlife Service provides the Department with technical assistance regarding fish and wildlife aspects of Department programs on active and abandoned mine lands, including review of State regulatory submissions and mining plans, and comments on mining and reclamation plans.

Outer Continental Shelf Lands Act Amendments of 1978 (43 U.S.C. 1801). This Act requires the Secretary of the Interior to manage an environmentally sound oil and natural gas development program on the outer continental shelf. The Fish and Wildlife Service provides recommendations for the Department regarding potential ecological impacts before leasing in specific areas and contributes to environmental studies undertaken subsequent to leasing.

Mineral Leasing Act of 1920, as amended (30 U.S.C. 185). This Act authorizes the Secretary of the Interior to grant rights-of-way through Federal lands for pipelines transporting oil, natural gas, synthetic liquids or gaseous fuels, or any other refined liquid fuel. Prior to granting a right-of-way for a project which may have a significant impact on the environment, the Secretary is required by this Act to request and review the applicant's plan for construction, operation, and rehabilitation of the right-of-way. Also, the Secretary is authorized to issue guidelines and impose stipulations for such projects which shall include, but not be limited to, ". . . requirements for restoration, revegetation and curtailment or erosion of surface land; . . . requirements designed to control or prevent damage to the environment (including damage to fish and wildlife habitat); and . . . requirements to protect the interests of individuals living in the general area of the right-of-way or permit who rely on the fish, wildlife and biotic resources of the area for subsistence purposes."

Cooperative Unit Act (16 U.S.C. 753(a)-753(b)). This Act provides for cooperative programs for research and training between the Fish and Wildlife Service, the States, and universities.

Airport and Airway Development Act (49 U.S.C. 1716). This Act requires the Secretary of Transportation to ". . . consult with the Secretary of the Interior with regard to the effect that any project . . . may have on natural resources including, but not limited to, fish and wildlife, natural, scenic, and recreation assets, water and air quality, and other factors affecting the environment . . .".

Department of Transportation Act (49 U.S.C. 1653(f)). This Act makes it national policy that ". . . special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites . . .," and requires that the Secretary of Transportation ". . . cooperate and consult with the Secretary of the Interior in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of the lands traversed." The Department of Transportation projects using protected lands cannot be approved unless there are no feasible and prudent alternatives to avoid such use and, if none, all possible measures to minimize harm have been considered.

EXECUTIVE

President's Water Policy Message (June 6, 1978). This Message directs the Secretary of the Interior to promulgate procedures for determination of measures to mitigate losses of fish and wildlife resources.

Water Resources Council's *Final Rules; Principles and Standards for Water and Related Land Resources Planning—Level C* (September 29, 1980). These rules reiterate the importance of participation in the development planning process by interested Federal agencies, including the Department of the Interior. This participation includes review, coordination, or consultation required under various legislative and executive authorities. Under these rules, "Consideration is to be given to mitigation (as defined in 40 CFR 1508.20) of the adverse effects of each alternative plan. Appropriate mitigation is to be included where suitable as determined by the agency decisionmaker. Mitigation measures included are to be planned for at least concurrent and proportionate implementation with other major project features, except where such concurrent and proportionate mitigation is physically impossible. In the latter case, the reasons for deviation from this rule are to be presented in the planning report, and mitigation is to be planned for the earliest possible implementation. Mitigation for fish and wildlife and their habitat is to be planned in coordination with Federal and State fish and wildlife agencies in accordance with the Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661-664) (sic)."

Executive Order 11990—Protection of Wetlands (May 24, 1977). This Executive Order requires that each Federal agency ". . . take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for: (1) acquiring, managing and disposing of Federal lands and facilities; and (2) providing federally undertaken, financed or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation and licensing activities." Relevant wetland concerns and values include, but are not limited to, maintenance of natural systems and long-term productivity of existing flora and fauna, habitat diversity, hydrological utility, fish, wildlife, timber, and food. Under this Order, a developmental project in a wetland may proceed only if no practicable alternatives can be ascertained and if the proposal . . . includes all practicable measures to minimize harm to the wetland that may result from its use."

Executive Order 11988—Floodplain Management (May 24, 1977). This Executive Order requires that Federal agencies take floodplain management into account when formulating or evaluating water or land use plans and that these concerns be reflected in the budgets, procedures, and regulations of the various agencies. This Order allows developmental activities to proceed in floodplain areas only when the relevant agencies have ". . . considered alternatives to avoid adverse effects and incompatible development in the floodplains . . ." or when, in lieu of this, they have ". . . designed or modified their actions in order to minimize potential harm to or within the floodplain . . .".

Executive Order 11987—Exotic Organisms (May 24, 1977). This Executive Order requires that Federal agencies shall restrict, to the extent permitted by law, the introduction of exotic species into the lands or waters which they own, lease, or hold for purposes of administration, and encourage the States, local governments, and private citizens to do the same. This Executive Order also requires Federal agencies to restrict, to the extent permitted by law, the importation of exotic species and to restrict the use of Federal funds and programs for such importation. The Secretary of the Interior, in consultation with the Secretary of Agriculture, is authorized to develop by rule or regulation a system to standardize and simplify the requirements and procedures appropriate for implementing this Order.

NATIONAL/INTERNATIONAL TREATIES

Federal Trust Responsibility to Indian Tribes. This responsibility is reflected in the numerous Federal treaties with the Indian tribes. These treaties have the force of law. Protection of Indian hunting and fishing rights necessitates conservation of fish and wildlife and their habitat.

Convention Between the United States and Japan (September 19, 1974). This Treaty endorses the establishment of sanctuaries and fixes preservation and enhancement of migratory bird habitat as a major goal of the signatories.

Convention Between the United States and the Union of Soviet Socialist Republics Concerning the Conservation of Migratory Birds and Their Environments (November 8, 1978). This Treaty endorses the establishment of sanctuaries, refuges, and protected areas. It mandates reducing or eliminating damage to all migratory birds. Furthermore, it provides for designation of special areas for migratory bird breeding, wintering, feeding, and molting, and commits the signatories to ". . . undertake measures necessary to protect the ecosystems in these areas . . . against pollution, detrimental alteration and other environmental degradation." Implementing legislation, Pub. L. 95–616, was passed in the United States in 1978.

Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (April 15, 1941). This Treaty has several provisions requiring parties to conserve certain wildlife resources and their habitats.

Convention Between the United States and Great Britain (for Canada) for Protection of Migratory Birds (August 1, 1916, as amended January 30, 1979). This Treaty provides for a uniform ". . . system of protection for certain species of birds which migrate between the United States and Canada, in order to assure the preservation of species either harmless or beneficial to man." The Treaty prohibits hunting insectivorous birds, but allows killing of birds under permit when injurious to agriculture. The 1979 amendment allows subsistence hunting of waterfowl outside of the normal hunting season.

APPENDIX B—OTHER DEFINITIONS

"Compensation," when used in the context of Service mitigation recommendations, means full replacement of project-induced losses to fish and wildlife resources, provided such full replacement has been judged by the Service to be consistent with the appropriate mitigation planning goal.

"Ecoregion" refers to a large biogeographical unit characterized by distinctive biotic and abiotic relationships. An ecoregion may be subclassified into domains, divisions, provinces, and sections. A technical explanation and map is provided in the "Ecoregions of the United States" by Robert G. Bailey, published by the U.S. Forest Service, 1976.

"Ecosystem" means all of the biotic elements (i.e., species, populations, and communities) and abiotic elements (i.e., land, air, water, energy) interacting in a given geographic area so that a flow of energy leads to a *clearly* defined trophic structure, biotic diversity, and material cycles. (Eugene P. Odum. 1971. *Fundamentals of Ecology)*

"Evaluation species" means those fish and wildlife resources in the planning area that are selected for impact analysis. They must currently be present or known to occur in the planning area during at least one stage of their life history except where species not present (1) have been identified in fish and wildlife restoration or improvement plans approved by State or Federal resource agencies, or (2) will result from natural species succession over the life of the project. In these cases, the analysis may include such identified species not currently in the planning area.

There are two basic approaches to the selection of evaluation species: (1) selection of species with high public interest, economic value or both; and (2) selection of species to provide a broader ecological perspective of an area. The choice of one approach in lieu of the other may result in a completely different outcome in the analysis of a proposed land or water development. Therefore, the objectives of the study should be clearly defined before species selection is initiated. If the objectives of a study are to base a decision on potential impacts to an entire ecological community, such as a unique wetland, then a more ecologically based approach is desirable. If, however, a land or water use decision is to be based on potential impacts to a public use area, then species selection should favor animals with significant human use values. In actual practice, species should be selected to represent social, economic and broad ecological views because mitigation planning efforts incorporate objectives that have social, economic, and ecological aspects. Species selection always should be approached in a manner that will optimize contributions to the stated objectives of the mitigation planning effort.

Most land and water development decisions are strongly influenced by the perceived impacts of the proposed action on human use. Since economically or socially important species have clearly defined linkages to human use, they should be included as evaluation species in all appropriate land and water studies. As a guideline, the following types of species should be considered:

- Species that are associated with Important Resource Problems as designated by the Director of the Fish and Wildlife Service (except for threatened or endangered species).

- Other species with monetary and non-monetary benefits to people accruing from consumptive and nonconsumptive human uses including, but not limited to, fishing, hunting, bird-watching and educational, aesthetic, scientific or subsistence uses.

An analysis based only on those species with directly identifiable economic or social value may not be broad enough to adequately describe all of the ramifications of a land and water use proposal. If it is desirable to increase the ecological perspective of an assessment, the following types of species should be considered:

- Species known to be sensitive to specific land and water use actions. The species selected with this approach serve as "early warning" or indicator species for the affected fish and wildlife community.
- Species that perform a key role in a community because of their role in nutrient cycling or energy flows. These species also serve as indicators for a large segment of the fish and wildlife community, but may be difficult to identify.
- Species that represent groups of species which utilize a common environmental resource (guilds). A representative species is selected from each guild and predicted environmental impacts for the selected species are extended with some degree of confidence to other guild members.

"Federal action agency" means a department, agency or instrumentality of the United States which plans, constructs, operates or maintains a project, or which plans for or approves a permit, lease, or license for projects or manages Federal lands.

"Fish and wildlife resources" means birds, fishes, mammals, and all other classes of wild animals and all types of aquatic and land vegetation upon which wildlife is dependent.

"Habitat" means the area which provides direct support for a given species, population, or community. It includes all environmental features that comprise an area such as air quality, water quality, vegetation and soil characteristics and water supply (including both surface and groundwater).

"Habitat value" means the suitability of an area to support a given evaluation species.

"Important Resource Problem" means a clearly defined problem with a single important population or a community of similar species in a given geographic area as defined by the Director of the Fish and Wildlife Service.

"In-kind replacement" means providing or managing substitute resources to replace the habitat value of the resources lost, where such substitute resources are physically and biologically the same or closely approximate those lost.

"Loss" means a change in fish and wildlife resources due to human activities that is considered adverse and;

(1) reduces the biological value of that habitat for evaluation species;

(2) reduces population numbers of evaluation species;

(3) increases population numbers of "nuisance" species;

(4) reduces the human use of those fish and wildlife resources; or

(5) disrupts ecosystem structure and function.

Changes that improve the value of existing habitat for evaluation species are not to be considered losses, i.e., burning or selective tree harvesting for wildlife management purposes. In addition, reductions in animal populations for the purpose of harvest or fish and wildlife managment will not be considered as losses for the purpose of this policy.

"Minimize" means to reduce to the smallest practicable amount or degree.

"Mitigation banking" means habitat protection or improvement actions taken expressly for the purpose of compensating for unavoidable losses from specific future development actions. It only includes those actions above and beyond those typically taken by Congress for protection of fish and wildlife resources.

"Out-of-kind replacement" means providing or managing substitute resources to replace the habitat value of the resources lost, where such substitute resources are physically or biologically different from those lost.

"Planning area" means a geographic space with an identified boundary that includes:

(1) The area identified in the study's authorizing document;

(2) The locations of resources included in the study's identified problems and opportunities;

(3) The locations of alternative plans, often called "project areas;" and

(4) The locations of resources that would be directly, indirectly, or cumulatively affected by alternative plans, often called the "affected area."

"Practicable" means capable of being done within existing constraints. The test of what is practicable depends upon the situation and includes consideration of the pertinent factors, such as environment, cost, or technology.

"Project" means any action, planning or approval process relating to an action that will directly or indirectly affect fish and wildlife resources.

"Replacement" means the substitution or offsetting of fish and wildlife resource losses with resources considered to be of equivalent biological value. However, resources used for replacement represent loss or modification of another type of habitat value. Replacement actions still result in a loss of habitat acreage and types which will continually diminish the overall national resource base. It should be clearly understood that replacement actions never restore the lost fish and wildlife resource—that is lost forever.

Dated: January 13, 1981.

Cecil Andrus,

Secretary of the Department of the Interior.

[FR Doc. 81–1895 Filed 1–22–81; 8:45 am]

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Attachment I

STATE COUNCIL OF GOVERNMENTS
WETLAND DATA BASE - USERS MANUAL

WETLANDS:

A National Database of State Wetland Protection Programs and Contacts

User's Manual

Version 1.2

WETLANDS is an electronic database for use by anyone with a computer and modem who is interested in state wetland protection efforts.

Produced by The Council of State Governments
in cooperation with
The United States Environmental Protection Agency

The Council of State Governments
The Center for the Environment and Natural Resources
P.O. Box 11910, Iron Works Pike
Lexington, Kentucky 40578

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FOREWORD

This User Manual and the electronic database WETLANDS for which the manual was written were produced by The Center for the Environment and Natural Resources of The Council of State Governments. Carl W. Stenberg is the Executive Director of The Council of State Governments.

The author of this user manual is R. Steven Brown, Director, Center for the Environment and Natural Resources, The Council of State Governments, Lexington, Kentucky.

The author of the Data Definition Language for WETLANDS is Brian Latonzea.

Support for this project was provided by the United States Environmental Protection Agency through its Office of Wetlands Protection under Contract X-814720-01-0.

WETLANDS Database User's Manual

PART I: INTRODUCTION

Introduction.

The purpose of this user's manual is to show how to use the WETLANDS database of State Wetlands Programs. The database consists of information about each state's wetland protection program, including many of the "nuts and bolts" items about the program. Also include is a comprehensive list of state officials concerned with wetland protection programs. The information in the database was originally gathered by EPA, and was updated for EPA by the Center for the Environment and Natural Resources of the Council of State Governments in 1988.

As with any database, data becomes out-of-date all too fast. If you have corrections, or if you are able to add to sections for which we have no data, we welcome your information. Data was supplied, for the most part, by state agency personnel.

Who Should Use the Database.

Anyone with access to a computer with a modem who is interested in the status and structure of state wetland protection programs should use the database. This includes state officials, federal officials, local government officials, citizens groups, industry, university researchers, and so on.

Cost and Access.

During the first year of operation there is no cost for use of the database, other than the cost of using your telephone to call the system. Anyone can access the system during the first few months of operation by using the Username and Password given later in the manual. Starting in 1989, you must apply for and be assigned your own Username and Password (at no cost other than postage).

PART II: INFORMATION ABOUT THE SYSTEM

Database Nomenclature.

The database is called WETLANDS, and consists of two subsets of data, WCON and WPRO.

WCON is an acronym for "Wetlands Contacts," i.e., those persons in the states that are active in some capacity in wetland programs. This data consists of names, organizational affiliation, addresses, phone numbers, and fields of expertise of people in state government wetland protection programs, and related programs.

WPRO is an acronym for "Wetlands Programs," i.e., the components of each state's wetlands programs. This data consists of the material collected in the bulk of EPA's original report for each state program, Alabama through Wyoming. It consists of a "matrix" of wetland programs. The first part of the matrix lists 13 wetland "Program Types" such as Acquisition, 401 Permits, Taxation, etc. Each of these 13 program types has 21 "Program Attributes", such as Name of Program, Legal Authority, Values Protected, etc. Since there are 50 states in the database, and each state has up to 13 program types, with each program type having up to 21 attributes, there are a maximum 13,650 pieces of information about the state programs. Each piece of information can range from no data to one or more paragraphs.

Users can access this data in a straightforward way, such as all information about state Taxation Programs, or in combination searches, such as information about the Legal Authority of Taxation Programs in Texas and adjacent states. There are many, many possible search combinations with both WCON and WPRO.

Database Location and Programming Information.

WETLANDS is housed on CSG's Digital MicroVax II computers in Lexington, and has been created by using BASIS software. BASIS is a relational database, and is supported by its author, the Battelle Institute.

PART III: HOW TO USE THE SYSTEM

Getting on the System: Using Your Modem.

Before you can use WETLANDS, you must know how to use your modem and your communications software on your computer. There are so many different kinds, that these instructions cannot be given in this manual. If you know how to use your modem and dial a number, you will easily be able to access the system. First, a few words about how the Database is organized are in order.

Database "Menus."

The supporting program for WETLANDS uses "Data Definition Language" (DDL) to create instructions for entering and accessing data. There are two modes for using the DDL instructions in WETLANDS, "novice" mode and "expert" mode. The primary difference between these two modes is that novice mode is menu-driven, whereas expert mode requires some knowledge of DDL commands. The WETLANDS database assumes that users will not be familiar with DDL commands, and thus the database has been created using menus in the novice mode. More advanced users will still be able to use expert mode if they desire, however CSG will not be giving instructions on how to use expert mode (but see Appendix).

"Menus" are lists of choices that the user selects by pressing one or two keyboard buttons. The use of menus is very common in most personal computer programs. For example, programs such as Lotus 1-2-3 (T) use menus. WETLANDS uses several different menus to access the database.

Database Screens.

The "screens" shown in Figures 1 through 17 are typewritten copies of the information that appear on the monitors of users as they use the WETLANDS database. To the extent possible, these figures are complete copies of the screens seen. All significant screens which are encountered in a routine novice session are displayed herein. Screens displayed while in expert mode are not shown.

LOGGING ON: Screens 1 and 2. [Please read this entire section before trying to log on to the system!] As a user, you will "log on" to the Council's Digital computer by having your computer modem dial (606) 254-3612, 24 hours a day (except during scheduled system back-ups or maintenance). To use our system, you should set your modem to: 1200,N,8,1 (1200 baud, no parity, 8 data bits, and 1 stop bits). This is done in your own communications program. These numbers are commonly used in communications, and so your computer may already be set to these numbers. If not, you will have to change your settings.

After receiving a CONNECT message, it is sometimes necessary to press the Return or Enter key one to three times (this is to allow your modem and the database's to equalize their operating speeds). You should try this if you do not receive the message shown at the top of Figure 1 within three seconds. If you fail to do this, you may be disconnected and will have to dail again.

Users will be greeted by the log-on screen shown in Figure 1. The purpose of this screen is to permit only authorized (pre-identified) users to access the database. Each user will then enter his/her pre-assigned identification code and a return (an "enter" button on some keyboards), then enter his/her self-created password and a return (password characters are not displayed on the screen). Assuming authorized IDs and passwords are used, Figure 3 will appear.

If for some reason the username or password cannot be accepted, Figure 2 (or part of it) will appear. If the log-on cannot be completed after three attempts, the user will be disconnected automatically. After a "User authorization failure" error message, you must press a Return or Enter to try again. If you take more than about 20 seconds to supply either the username or password, the system will disconnect you. If you make a mistake entering the username or password, you may be able to backspace and re-enter, or you could just go ahead and press a Return, get the error message, and try again. Remember, you get three tries to enter the username and password, and even if these fail, all you have to do is redial and try again.

During 1988, anyone can access the system by using the following:

USERNAME: WETLANDS
PASSWORD: wetlands

[Note: You may use capital letters or not, as you prefer.]

Log-on Problems: If you are having trouble logging on, disconnect and try again. Make sure that your username and password are correct. Sometimes telephone transmission of data is "dirty", i.e., there are a lot of extraneous and nonsensical characters on your screen, even though you may have not pressed any keys. You may find this to be a problem especially during bad weather. If this is particularly troublesome, try redialing. From time to time the system may ask you to change your password. Just follow the instructions on the screen if this happens.

A Caution About Logging-Off: It is important that you log-off the system properly (described below) to prevent possible "lock-out" of other people using the system. If you find it difficult to log-on, and other items listed herein seem to be all right, please call us to see if either the system is down, or if someone has improperly logged-off and lock up the database.

GREETINGS: Screen 3. Screen 3 is a greeting screen which contains the name of the database, and the address and phone of CSG. Screen 3 will stay on the monitor for about four seconds, then will automatically move to Screen 4. It is best not to strike any keys during this time. [Accidental keystrokes at anytime may have unpredictable (but from our point of view, harmless) results.]

MAIN MENU: Screen 4. Screen 4 is the WETLANDS Main Menu and is depicted in Figure 4. This screen presents the user with two basic choices, "System Functions" and "Databases." System functions are explained below, and are selected by pressing the designated letter and a return. The database choices let the user choose between WCON or WPRO by selecting the appropriate number and pressing a return. An incorrect letter or number will result in an error message (such as "3 is an incorrect entry.") and a fresh screen (i.e., screen 4 will be re-displayed).

If a correct choice is entered then the information below the line reading "PLEASE ENTER YOUR CHOICE:" will appear. This information presents some administrative details and then asks if the user is a novice. A "y" answer will take the user to menus, while a "n" answer will take the user into expert mode (not recommended for beginners). Other answers will cause a re-display of the screen and question.

A second question will then appear. This question asks what kind of terminal the user has. There are three choices (VT100, IBM3270, and OTHER) that accommodate the type of terminal used. Any terminal capable of sending and receiving ASCII characters can be used, but you should enter OTHER unless you have one of the two terminal types listed, otherwise you will get an error message. You may wish to try VT100 at least once, as it often presents a "cleaner" display of data.

System Functions. These are "housekeeping" items, and they do not contain any data about state wetland protection programs. Their functions are:

L) Logoff. Select this item when you have completed a session and are ready to quit the database. After selecting Logoff, you will receive some internal system accounting information (probably of no importance to you). At this point, you can either disconnect using your communications software commands, or you can press Return/Enter, and our system will give you the opportunity to log on to the Wetlands Database again.

N) System News. This item carries information about system changes, updates, etc. It is usually one screen long. After reading the information, press Return/Enter to return to the Main Menu.

P) Change your password. This item may be used from time to time if you wish to change your password. [Please DO NOT change the password of the Username "Wetlands", as this Username is intended for everyone.]

The WCON and WPRO Options.

Pressing a "1" (without the quotation marks) will take you to the WCON (State Wetland Contacts) database. Pressing a "2" will take you to the WPRO (State Wetland Programs) database.

In general, you will follow these Three Steps when using WCON or WPRO:

1. Select one of the search categories on the menu,
2. Run the search to see if any data exists, and then
3. Display the data.

WCON MENU: Screen 5. If you chose "1" you will receive Figure 5 as the next screen. Figure 5 is a representation of the WCON Search Menu, i.e., the menu that appears for searching the state wetland program contacts. On this screen, you will search for information by setting up search conditions. You may enter a number to define your search, or a letter to execute the search or return to the main menu. How this is done is explained in the following paragraphs.

The user has four general search choices on the WCON database menu:

1 PROGRAM TYPE
2 NAME
3 ORGANIZATION
4 STATE

There are more options below these four. These options have letters in front of them instead of numbers and are used AFTER the user has selected one (or more) of the Numbered Items. They are:

The "C" (Cancel the Search) item lets you erase a search that failed to find a sufficient number of records.

The "X" (Execute the Search) item tells the system to pull the records up for potential viewing.

The "LI" (List and Combine Searches) lets the user make combination searches (explained in Advanced Techniques).

The "EX" (Go to Expert Mode) lets the user enter the system more directly, avoiding menus. Although available, Expert Mode is NOT RECOMMENDED for casual users.

The "LO" (Leave the WCON Database) will return the user to the WETLANDS Main Menu.

The user may search for state wetland program contacts in a wide variety of ways:

Individual search of one of the above four major groups;
Combination search of two, three, or four of the major groups.

Figure 6 shows the screen that will be displayed if "1 Program Type" is chosen.

Figure 7 shows the screen that will be displayed if "2 Person's Name" is chosen.

Figure 8 shows the screen that will be displayed if "3 Organization" is chosen.

Figure 9 shows the screen that will be displayed if "4 State" is chosen.

For example, the user could search for everyone with the last name of "Williams" in the database, or could search for every "Williams" that might be with the state of MD, VA, or DE, or could search for every "Williams" in those states who works in a "Coastal Law" program.

A user could also list every "Coastal Law" contact in all 50 states, or could list every wetlands contact who serves in more than one program, etc. There are thousands of possible combinations.

WCON Example.

For the following example, we will assume that the user wants to search the wetlands contacts database in all 50 states for people named "Williams." Our presumption for this example is that the user met a person named "Williams" at an EPA wetlands conference, but cannot remember the full name or how to contact the person. From Screen 5, the user enters "2" (Person's Name) and a return at the prompt.

Screen 6. Screen 6 now appears. This screen is the same as Figure 7. The user enters the name "williams*" at the prompt and presses the RETURN key. The user has added an asterisk to make sure that all names containing "williams" in whole or in part are found. This would include names like "Williamson" and "Williams-Lester." If our user thought the person's last name might be just "William" then he should enter "william*". Asterisks are often used this way in programs as "wild cards," that is, an asterisk stands for all possible entries except blanks..

At this point, the user has completed Step 1 of the Three Steps in searching.

[Note that our user might have gone to the screens shown in Figures 6, 8 or 9 if he/she had pressed a 1, 3, or 4 during the previous screen.]

Screen 7. Screen 7, as shown in Figure 10, now appears. Note that this screen looks very similar to Figure 5. In fact, the only difference is that in the upper right-hand part of the screen, the number of "hits" for "williams*" is displayed. A "hit" is a piece of data that indicates the number of records fulfilling the search requirements. In our case, there are 30 records that contain "williams" as all or part of a person's name. Notice that the message "30 - williams*" appears on the same line as "Person's Name". This should help you remember what category you were searching. (This feature is particularly helpful when doing combination searches.)

Our user decides to look at the 30 records and see if he recognizes the person's name. At the prompt, the user types in "X" (for execute the search) and presses Return/Enter. This begins the collection and display of the 30 records.

Screen 8. Screen 8, as shown in Figure 11, now appears. This screen offers the opportunity to narrow the search criteria to a more manageable number of records. Because our user only found 30 "hits", and because he/she does not mind looking through 30 records for the right name, the user selects "no" for the questions asked by pressing "n" and RETURN.

At this point, the user has completed Step 2 of the Three Steps.

It is possible that zero hits might have occurred. If you get zero hits, it means that there are no data in the database that meet your search criteria. If you are conducting a combination search (see Advanced Techniques), it may mean that your combination does not exist. Anytime you get zero hits, you should press "C" (Cancel current search) as soon as you return to the WCON or WPRO menu. You will know if you have successfully cancelled the search if no zeroes appear to the right of the search categories.

[Additional screens that allow narrowing of the search appear if "y" is entered. These screens are shown in the Advanced Techniques section of this manual.]

Screen 9. Screen 9, as shown in Figure 12, now appears. This screen is the "Output Menu" and offers the user several alternatives for seeing the results of his search. To select any item, type in the two letter code and a Return/Enter. Incorrect entries result in an error message, followed by a re-display of the screen (you get to try again).

Searches.

Some users may be confused about why they must select a numbered item off the WCON menu, get a result for the number of "hits" and then press a "X" to execute the search. After all, it seems like getting the number of "hits" is the search, so why do you have to press an additional key?

The answer has to do with the way the system looks up data. Rather than thumbing through every shred of data, the system just looks at codes (defined by you when you select a numbered item off the search menu), finds the items, and tells you how many it has found. Then, when you tell the system to "X" (execute the search), it actually goes and pulls the records out for you to see.

To make an analogy: selecting a numbered item is like asking a librarian if there are any books on history in the library. The librarian will say yes, there are 200 books. At this point, you would decide whether you really wanted to see 200 history books (i.e., execute the search), or whether you would want to narrow your search. Finally, you would actually go and get the books and look at them (i.e., display the data as explained in the next paragraph). The WETLANDS database system works the same way.

Output Menu Options.

The "DI" option will display each "hit" (record) one at a time on the screen. In the event that a record is too long to fit on the screen, it will either "scroll" off the top of the screen, or will pause until the user presses Return/Enter. Some terminals have keys that will temporarily halt scrolling, some do not. While in the middle of a display session, the Control-C keys will halt the session, and return the user to the Output Menu (press the Control key and the C key simultaneously -- not all terminals have a Control key). The Control-S keys combination (for MS-DOS systems), or on some keyboards the "Hold Screen" button will temporarily suspend further screen display. Display can be reactivated by a Return/Enter on many terminals, or by a Control-Q. Please note that the above key combinations may not work on your terminal or with your communications software.

The "PR" selection will cause a printout to be made at the CSG printer in Lexington (an "off-line" print), but not at the user's terminal. The PR command will only be of use to users who have acquired their own Username and Password. For these users, CSG will mail any printouts to the address you give during the log-off procedure. [Please note that the log-off procedure is slightly different if you have asked for a printout of data, in that you are asked to give your name and address.] Other users may wish to use any "print screen" feature that their computer may have, or any "capture file" options that their communications software may have.

The "SE" selection lets the user return the the previous search menu. This option would be used if you decided that you made a mistake or were not ready for the Output Menu.

The "EX" selection takes the user into Expert Mode. Expert mode lets the user access the database without the use of the menus. This is generally faster, but is much less forgiving. It also requires some knowledge of BASIS DDL language, which is beyond the scope of this manual. Those of you that are particularly interested in Expert Mode, should see the Appendix. For most of us, this option is not needed.

The "LO" option will return the user to the Main Menu. This will enable the user to leave the database and end his session in WETLANDS. The "LO" option is provided mainly as a convenient "quick out" after data has been displayed.

Pressing the "H" key will provide a brief statement about each of the above commands as a reminder.

Back to our example, the user selects "di" for screen display.

Screen 10. This screen, as shown in Figure 13, is the display of the data found. Each of the 30 records will appear on a separate screen, and stay on the screen until the user presses RETURN or one of the other commands.

For our example, only one record is shown, instead of all 30 records.

At this point, the user has completed step 3 of the Three Steps.

Logging Off. Once the user has gotten the data he/she wants, the user will either continue with other work or "back out" of the system by going to various screens already discussed and entering appropriate commands. For example, from the Output Menu, the user would enter a LO and would get a line at the bottom of the screen that reads "***** YOU ARE LEAVING THE WCON DATABASE". After a short pause, Figure 4, The WETLANDS Main Menu Screen will appear. Entering a "L" will enter the session, as the user receives a "good-bye" screen (not depicted).

The WPRO Menu. Working with the Wetlands Programs (WPRO) menu is handled in the same manner as the WCON menu. The WPRO menu differs slightly in appearance in order to accommodate the different data elements in the menu. WPRO's counterpart to Figure 5 (WCON menu) is shown in Figure 14. Follow-up screens are shown in Figure 15 and 16. The output menus are the same as in WCON, except for the Records Display, which is shown in Figure 17.

The meaning of each of the search items is explained in the WPRO Glossary at the end of the User Manual.

WPRO Example. By now, you should be more familiar with the workings of the menus and the database. In this example, we will use the WPRO database in much the same fashion as the WCON database. Somewhat less explanation will be given.

The scenario for this search is that a user wants a list and description of all the states' Section 401 programs, so that he can compare his state to the others.

After successful logon, the user selects "2" (WPRO) from the WETLANDS Main Menu. He now arrives at the screen depicted on Figure 14. He wants to search for the 401 programs, so he selects "1", Program Types, to list all the available wetlands programs.

This action results in the screen shown on Figure 15 being shown. The user types in "401" to select 401 Programs.

The WPRO Search Menu reappears, with a number to the right of the Program Types line. This number is 45, indicating that the database has information on 45 of the Section 401 programs in the states. Note that this does not necessarily mean that there are only 45 Section 401 programs, but that the database only has data on 45 of them.

The user is satisfied with his search, and presses "X" and a Return/Enter to execute the search.

The output menu soon appears, and the user selects "DI" to display the 45 items on his screen. After a few seconds, the items begin appearing, with the complete information for each state being displayed one at a time (see Figure 17 for a fictitious example). To view the next state, the user presses a Return/Enter. To stop the display of data before it has shown all data (and return to the Output Menu) press a Control-C.

Figure 1. CSG Log-on Screen, Successful Log-on.

```
           Welcome to The Council of State Governments

Username: WETLANDS
Password:

                          WELCOME TO THE COUNCIL OF
                          STATE GOVERNMENTS SYSTEM



     Last interactive login on Monday, 7-MAR-1988 12:04
     Last non-interactive login on Friday, 4-MAR-1988 14:18
```

[Note: Passwords never are displayed on CSG's system.]

Figure 2. Log-on Failure Screen.

```
             Welcome to The Council of State Governments

Username: WETLANDS
Password:
User authorization failure
Username: WETLANDS
Password:
User authorization failure
Username: WETLANDS
Password:
User authorization failure
NO CARRIER
```

Figure 3. Greeting Screen

```
WWW       WWW EEEEE TTTTTTT LLL        AAAA   NN        NN DDDD       SSS
WWW       WWW EEEEE TTTTTTT LLL      AA    AA NNNN      NN DDDDD   SSS   SSS
WWW       WWW EEE     TTT   LLL      AA    AA NNNN      NN DD   DD SS       SS
WWW       WWW EEE     TTT   LLL      AA    AA NN NN     NN DD    DD SS
WWW       WWW EEEEE   TTT   LLL      AA    AA NN  NN    NN DD    DD  SSS
WWW       WWW EEEEE   TTT   LLL      AAAAAA   NN   NN   NN DD    DD    SSS
WWW   W   WWW EEE     TTT   LLL      AA    AA NN    NN  NN DD    DD      SSS
WWW  W W  WWW EEE     TTT   LLL      AA    AA NN     NNNNN DD    DD        SS
WWWW     WWWW EEE     TTT   LLL      AA    AA NN      NNNN DD   DD  SS     SS
WWWW     WWWW EEEEE   TTT   LLLLLLL  AA    AA NN       NNN DDDDDD  SSS   SSS
WWW       WWW EEEEE   TTT   LLLLLLL  AA    AA NN        NN DDDD       SSS
```

The Council of State Governments
P.O. Box 11910
Iron Works Pike
Lexington, Kentucky 40578
(606) 252-2291

Figure 4. WETLANDS Main Menu.

```
                    W E T L A N D S   M A I N   M E N U
=========================================================================
System Functions              |              Databases
=========================================================================
                              |
(L) Log off the system        | (1) WETLANDS CONTACTS DIRECTORY (WCON)
                              |
(N) Read the system news      | (2) WETLANDS PROGRAM INFORMATION (WPRO)
                              |
(P) Change your password      |
                              |
                              |
                              |
                              |
=========================================================================

                     PLEASE ENTER YOUR CHOICE:  1

BASIS     R520.21  870302
THE WETLANDS CONTACT DATABASE IS ON-LINE
    The last update was on 880911
Are you a NOVICE WCON database searcher?  --> y

What Type of Terminal are You Using (VT100,IBM3270,OTHER)? --> vt100
```

Figure 5. WCON Search Menu.

```
SEARCH MENU

         1    Program Type
         2    Person's Name
         3    Organization
         4    State

C  Cancel Current Search
X  Execute Search                          EX   Go to Expert mode
LI List & Combine Searches                 LO   Leave the WCON Database

    Enter selection and press RETURN
    OR   Press H for help on all fields
    OR   Press H with selection for help
            on a specific field        ------> 1
```

Figure 6. WCON "Program Type" Screen

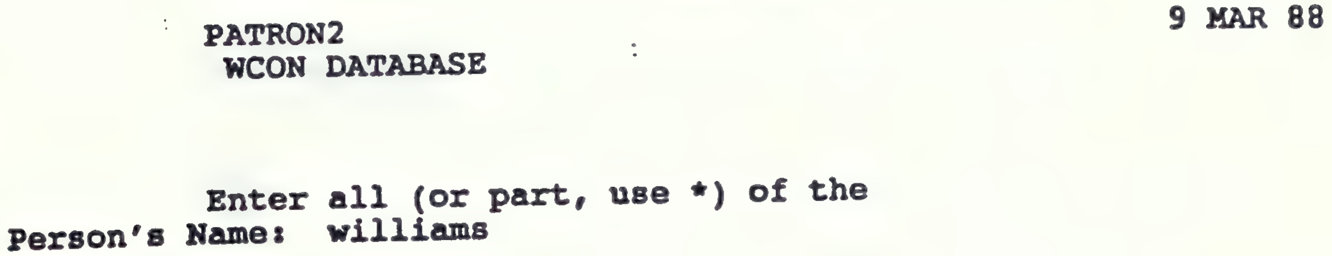
```
          PATRON                                           9 MAR 88
           WCON DATABASE


     Choose a program type from the following list by entering the 3
digit code and pressing RETURN.

          ACQ = Acquisition
          LEG = Legal Council/Legislative Liaison
          CWP = Coastal Wetland Program
          CZM = Coastal Zone Management
          401 = 401 Permits
          404 = 404 Permits
          FLD = Floodplain Programs
          FCR = Freshwater and Coastal Programs
          FWP = Freshwater Wetland Programs
          LOC = Local Programs
          SEP = SEPA (State Env. Policy Acts)
          TAX = Taxation Programs
          MAP = Mapping Programs
          RES = Research
          OTH = Other Programs
          *   = All

FIND PROGRAMS OF TYPE: acq
```

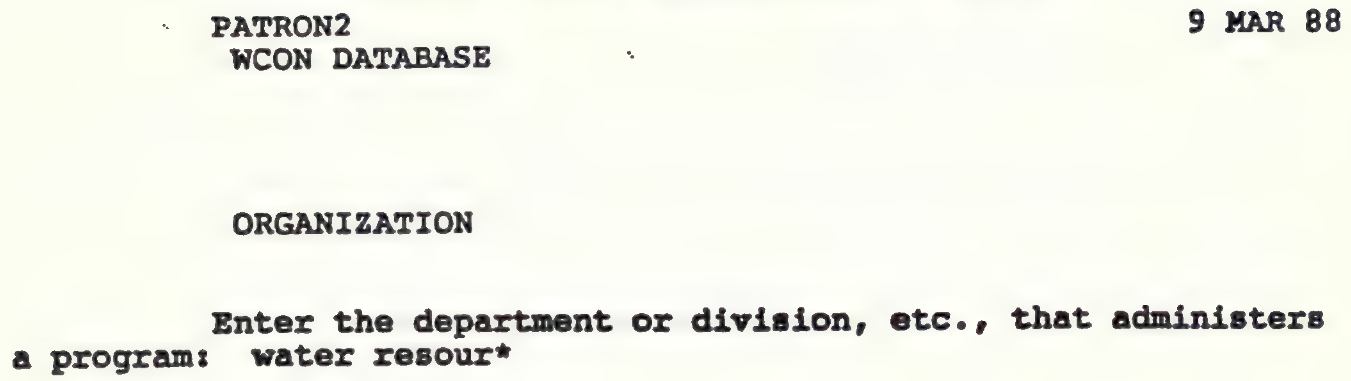
Figure 7. WCON "Person's Name" Screen



```
          PATRON2                                              9 MAR 88
           WCON DATABASE


          Enter all (or part, use *) of the
Person's Name:  williams
```

Figure 8. WCON "Organization" Screen



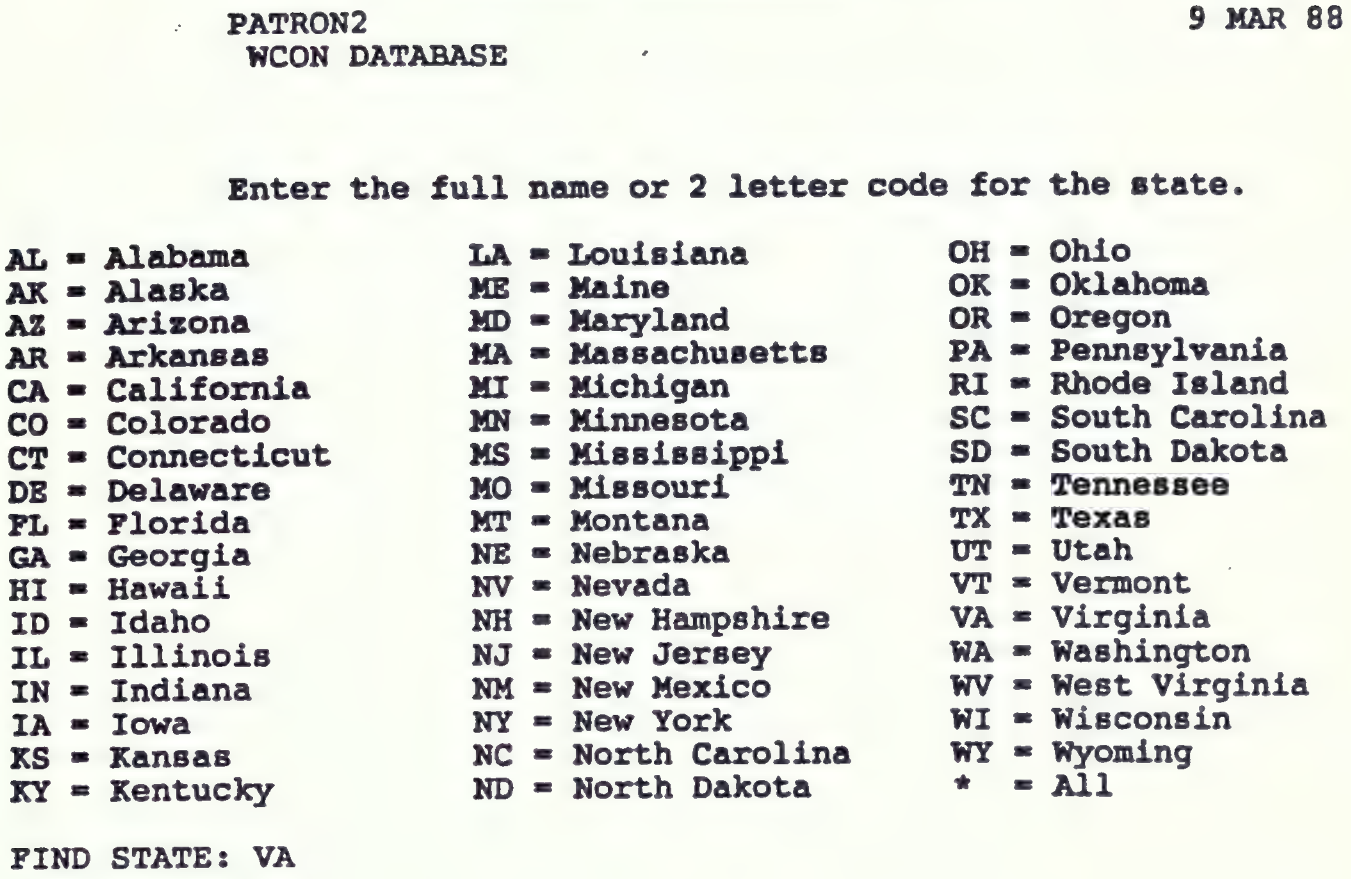
PATRON2
WCON DATABASE

9 MAR 88

ORGANIZATION

Enter the department or division, etc., that administers a program: water resour*

Figure 9. WCON "State" Screen



```
         PATRON2                                                 9 MAR 88
          WCON DATABASE


         Enter the full name or 2 letter code for the state.

AL = Alabama                LA = Louisiana              OH = Ohio
AK = Alaska                 ME = Maine                  OK = Oklahoma
AZ = Arizona                MD = Maryland               OR = Oregon
AR = Arkansas               MA = Massachusetts          PA = Pennsylvania
CA = California             MI = Michigan               RI = Rhode Island
CO = Colorado               MN = Minnesota              SC = South Carolina
CT = Connecticut            MS = Mississippi            SD = South Dakota
DE = Delaware               MO = Missouri               TN = Tennessee
FL = Florida                MT = Montana                TX = Texas
GA = Georgia                NE = Nebraska               UT = Utah
HI = Hawaii                 NV = Nevada                 VT = Vermont
ID = Idaho                  NH = New Hampshire          VA = Virginia
IL = Illinois               NJ = New Jersey             WA = Washington
IN = Indiana                NM = New Mexico             WV = West Virginia
IA = Iowa                   NY = New York               WI = Wisconsin
KS = Kansas                 NC = North Carolina         WY = Wyoming
KY = Kentucky               ND = North Dakota           *  = All

FIND STATE: VA
```

Figure 10. WCON Search Menu, "Hits" Displayed.

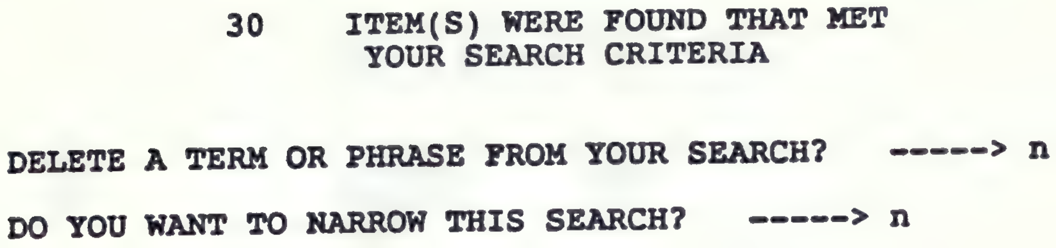
```
16SEARCH MENU

        1    Program Type
        2    Person's Name                30 - williams*
        3    Organization
        4    State

C  Cancel Current Search
X  Execute Search                    EX   Go to Expert mode
LI List & Combine Searches           LO   Leave the WCON Database

    Enter selection and press RETURN
    OR   Press H for help on all fields
    OR   Press H with selection for help
            on a specific field       ------> x
```

Figure 11. "Narrow" Screen.



```
            30    ITEM(S) WERE FOUND THAT MET
                   YOUR SEARCH CRITERIA

DELETE A TERM OR PHRASE FROM YOUR SEARCH?    -----> n

DO YOU WANT TO NARROW THIS SEARCH?    -----> n
```

Figure 12. Output Menu.

```
            OUTPUT MENU


DI    Display the Items
PR    Print the Items
SE    Return to Search Menu

EX    Go to Expert Mode
LO    Leave the WCON Database



Enter selection and press RETURN
OR press H for help     ----> di
```

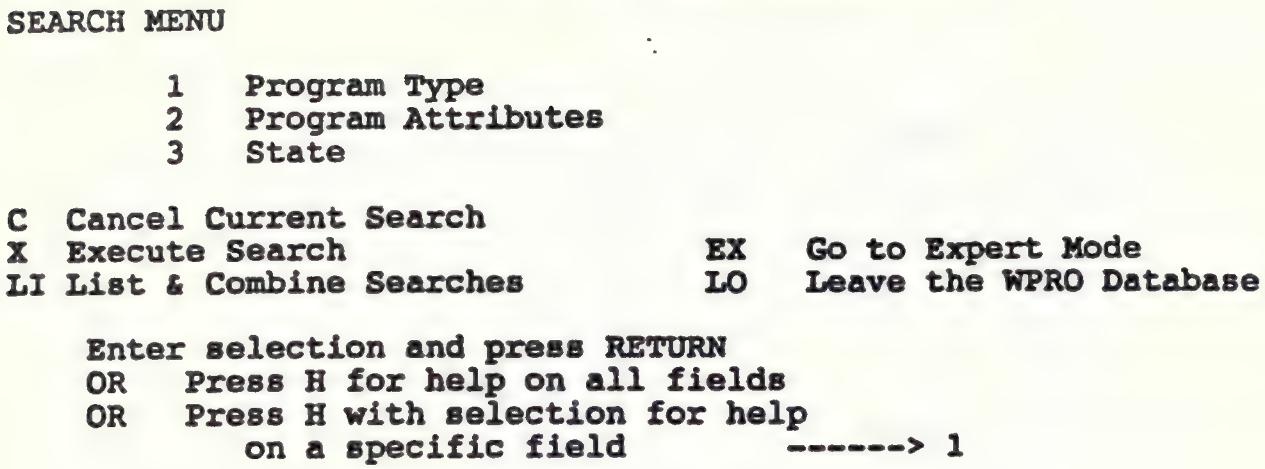
Figure 13. WCON Records Display.

```
Item 1

        Program Type              Taxation
        Name                      Jerry Williams
        Organization              Department of Conservation
                                  Division of Water
        Address                   P.O. Box 180
        City                      Jefferson City
        State                     Missouri
        Zip                       65102-0180
        Phone                     (314) 751-4115
        Access Number             999

HIT RETURN FOR NEXT ITEM
```

Figure 14. WPRO Search Menu.



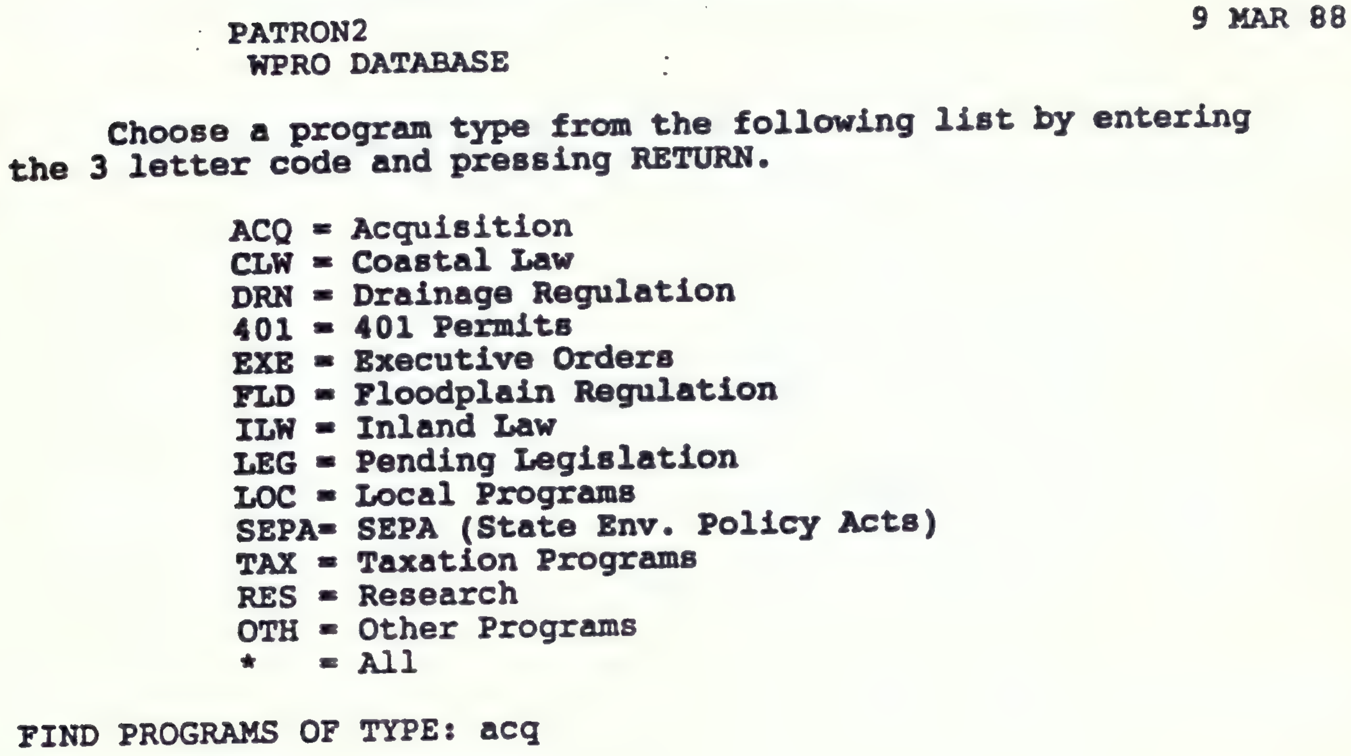
```
SEARCH MENU

        1    Program Type
        2    Program Attributes
        3    State

C  Cancel Current Search
X  Execute Search                      EX   Go to Expert Mode
LI List & Combine Searches             LO   Leave the WPRO Database

    Enter selection and press RETURN
    OR   Press H for help on all fields
    OR   Press H with selection for help
             on a specific field        ------> 1
```

Figure 15. WPRO "Program Type" Screen



```
     PATRON2                                              9 MAR 88
      WPRO DATABASE

     Choose a program type from the following list by entering
the 3 letter code and pressing RETURN.

          ACQ = Acquisition
          CLW = Coastal Law
          DRN = Drainage Regulation
          401 = 401 Permits
          EXE = Executive Orders
          FLD = Floodplain Regulation
          ILW = Inland Law
          LEG = Pending Legislation
          LOC = Local Programs
          SEPA= SEPA (State Env. Policy Acts)
          TAX = Taxation Programs
          RES = Research
          OTH = Other Programs
          *   = All

FIND PROGRAMS OF TYPE: acq
```

Figure 16. WPRO "Program Attribute" Screen

```
          PATRON                                                    9 MAR 88
           WPRO DATABASE

Each of the Program Types has the following Attributes.  Choose
     an attribute from the following list by entering the 3 letter
     code and pressing RETURN.

     NAM = Name of Program                     EDU = Education
     AGE = Administering Agency                PRO = Problems
     IMP = Implementation Method               SUC = Success
     LEG = Legal Authority                     EPA = EPA Role
     RES = Resources (Funds and Staff)         NED = Needed from EPA
     LND = Lands Covered                       TAK = "Taking" Issues
     INV = Inventory and Classification        MIT = Mitigation
     ACT = Activities Regulated                CUI = Cumulative Impacts
     EXP = Exemptions                          WET = Wetland functions
     VAP = Values Protected                    OTH = Other Comments
     COM = Compliance                          *   = All


FIND ATTRIBUTE TYPE: nam
```

Figure 17. WPRO Sample Record Display.

```
Item 1

          Program Type             401
          Name of Program          Permits Section
          Administering Agency     Department of Conservation
          Legal Authority          Revised Statutes Chapter 401,
                                   Sections 10-300
          Resources
          Lands Covered            Use EPA definition
          Inventory/Class.         Contracted to State University
          Activities Regulated     federal definition
          Exemptions               federal definition
          Values Protected         water quality and quantity; scenic
                                   lands
          Compliance               through Corps 404 programs
          Education                through Department's Public
                                   Programs Office
          Problems                 limited jurisdiction of 404
                                   program and lack
                                   of enforcement attitude of Corps
          Success                  have reached agreement with State
                                   Highway Department to cover
                                   mitigation of disturbed
                                   wetlands
          EPA Role                 increase 404 compliance activities
          Needed from EPA          take lead when wetlands are
                                   outside Corps jurisdiction
          "Taking" Issues          not applicable in this state
          Mitigation               Follow USFWS policy; legislature
                                   appropriated $250K for Bayou de
                                   Chein
          Cumulative Impacts       Departmental working group
                                   studying
          Wetland Functions        working group reviewing Adamus
                                   method
          Other Comments
          Access Number            99999

     HIT RETURN FOR NEXT ITEM
```

Figure 18. Combined Search Display.

```
          Enter one answer per prompt and press RETURN
          OR   press RETURN to terminate the prompts.


     4/ LIST

     .ITEMS.  LINE           REQUEST
*          2     1/    type=tax
*          2     2/    type=acq
*          5     3/    cui=*  (  4  TERMS COMBINED)

          Your first selection?  ----->
```

Figure 19. Entering Boolean Operators in a Combined Search.

```
          Enter one answer per prompt and press RETURN
          OR   press RETURN to terminate the prompts.


     4/ LIST

     .ITEMS.  LINE            REQUEST
*          2     1/    type=tax
*          2     2/    type=acq
*          5     3/    cui=*  (  4  TERMS COMBINED)

          Your first selection?   -----> 1
          The Boolean Operator to be used?   -----> or
          Your first selection?   -----> 2
          The Boolean Operator to be used?   -----> and
          Your first selection?   -----> 3
          The Boolean Operator to be used?   ----->
```

APPENDICES

OTHER IMPORTANT BITS OF INFORMATION

Problems and Help.

If things just do not seem to be working right, give us a call for user support. PLEASE MAKE SURE YOU HAVE READ THE MANUAL BEFORE YOU CALL US! Our ability to respond to user problems is limited to items not discussed in this User Manual, or to corrections of the manual. We also would love to hear your suggestions for improvement at any time. Call the following people:

PHONE NUMBER: (606) 252-2291 (Eastern Time Zone)
NORMAL HOURS: 9:00 - 5:00, Monday - Friday
(but the Database is almost always available)

General Use Questions:	Steve Brown or Joyce McCord
System Status Questions:	Brad Riddle or Richard Tyson
Username and Password Questions:	Brad Riddle or Steve Brown

Integrated State Management Information System (ISIS).

Now that you know how to use WETLANDS, you also have essentially learned how to use ISIS, the Council's bibliographic database on state government publications! ISIS covers a wide variety of topics, including environment and natural resources, using similar menus and the same commands as WETLANDS. Please call Bill Voit at the above phone number, or write for more information:

ISIS
The Council of State Governments
P.O. Box 11910
Iron Works Pike
Lexington, KY 40578

Advanced Techniques

COMBINATION SEARCHES (List and Combine)

One of the most powerful uses of the database is to make searches for specific data. This is most often accomplished by combining several search criteria across two or more data fields. Combined searches are made in both the WCON and WPRO databases.

Combined searches are made by combining two or more fields. In the WCON Database these fields are:

1 Program Type
2 Person's Name
3 Organization
4 State

In the WPRO Database these fields are:

1 Program Type
2 Program Attributes
3 State

Thus, in the WCON database, a user could search for a couple of Program Types and some States to see if these states had contacts for these programs. In the WCON database, a user could search some Program Types and some Program Attributes to see what the cumulative effects on wetlands of acquisitions and taxation programs have been.

A combined search is built by first executing a series of individual searches, and then combining these individual searches by using "Boolean logic." For those of you who may not remember Senior math, Boolean logic tests the truth of statements using "and", "or", "nor", etc. An example: if your car is registered in such a fashion that either you or your spouse could sell it without being co-signed by the other, then a Boolean "or" has been used. That is, the statement "Ralph or Susan may sell the car" is true. The statement "Ralph and Susan may sell the car" (i.e., it takes both of them) is not true, because both signatures are not required to sell the car.

Let's say that a user has been asked to gather some information to present to a departmental wetlands taskforce on whether the state should promote a tax relief program, and whether the state should pursue a more vigorous wetland acquisition program. If you decide to follow along with the example, you may get different numbers of "hits" because of updates to the database.

To do this, the user will use the WPRO database to search for the states that have these programs to see what the cumulative effects of Taxation and Acquisition programs have been on wetland protection.

After entering the system the user selects "tax" on the Program Type search menu in WPRO. Returning to the WPRO menu, he finds 2 "hits." As you recall, this means there are 2 taxation programs of some sort in the states (some states may have more than one). Now, instead of hitting "X" and executing the search, select "acq" from the Program Type menu, resulting in 2 "hits." At this point the WPRO Search Menu lists 2 hits for "tax" and 2 for "acq."

Note that he could elect to do a combined search now, which would list all the information for each state's taxation and acquisition programs. Since our user really is only interested in the cumulative impact (one of the program attributes), he will further restrict the search.

The user now returns to the WPRO menu and selects "2" to pick the attribute he wants to check. He selects "cui" for Cumulative Impacts and enters it. The search menu is redisplayed, and now shows 5 "hits" for cumulative impacts.

Now we will conduct the combined search by pressing "LI" and a Return/Enter. A screen very similar to Figure 18 now appears. This screen shows the recent search topics (tax, acq, and cui) and the number of hits for each (2, 2, and 5). The search topics are shown under the heading REQUEST, and the number of hits under the heading ITEMS.

At this point we are ready to enter the Boolean operators (see Appendix for list), and indicate which items are to be combined. Our user, remember, wants to look for all taxation and acquisition programs, but only the cumulative impact attributes of these programs. In Boolean terms, this is expressed as: taxation OR acquistion AND cumulative. Figure 19 shows how this is entered into the system.

The order of the entry is not important, except for the location of the Boolean operators between the items. For example, the combined search could have been made: cumulative AND acquisition OR taxation. On the screen this would have been entered as: 3 AND 2 OR 1. Finally, when done with the combinations, press a return when asked for the next Boolean operator to terminate the prompts and begin the combined search, and go to the display screens (not shown here).

NARROWING SEARCHES.

Often when a search finds a large number of "hits" the questions shown at the bottom of Figure 11 will appear. These questions should normally be answered no by entering "n" and a Return/Enter. WETLANDS has been designed to prevent the necessity for excessive use of these options, but in some combined searches the options may provide a way to narrow a search without starting over.

If "y" is answered to the first question:

```
DELETE A TERM OR PHRASE FROM YOUR SEARCH?  -----> y
```

the following second question will appear:

```
ENTER THE TERM OR PHASE TO BE DELETED  ----->
```

At this point, you would enter one of the codes displayed as a "hit" at the top of the screen (not shown in this example). Then the program continues the search, or returns you to the previous screen.

If "n" is answered to the first question, the following question appears:

```
DO YOU WANT TO NARROW THIS SEARCH?  ----->
```

If "y" is answered, the following phrase will appear:

```
ALL TERMS WILL BE SEARCHED FOR IN THE LAST DOCUMENT SET CREATED
```

This statement deletes the last item added to your search list. If you are currently only searching one item, this will cause you to get zero "hits," but it will not cancel the current search. This action will preserve the search for use in a "List and Combine" operation, however.

EXPERT MODE.

Expert Mode is available to users who are familiar with most of the search criteria in the database, and who feel that the menu methods are too slow. Expert mode has fewer menus, substituting direct commands for accessing the data instead.

Explaining Expert Mode fully is beyond the scope of this User Manual, however a few instructions will be given for those who feel ready and adventurous.

To enter expert mode, type "n" and a Return/Enter after selecting either WPRO or WCON off the Main Menu. Selecting "n" tells the system that you are not a novice. The system will then take you to the WCON or WPRO Search Menu, where you will select a field to search as usual. The difference is that instead of being given a list of the categories, you will have to enter the code directly. For example, type in "acq" to list acquisition program data.

An even more advanced version of Expert Mode can be entered by typing in "EX" on the WCON or WPRO Search Menus. The screen will clear and will present some information about how to return to the Main Menu (/patron), and how to learn more about Expert Mode by using the Tutorial (/tutorial).

The WPRO Search Menus: A Glossary of Terms

The WPRO Search Menu allows for a detailed search into the organization and authority of each state's wetland protection programs. So many options are available, however, that the search screen may be a bit intimidating. This glossary is provided to explain a little more about the search terms on each WPRO menu.

The primary WPRO search menu is shown in Figure 14. Only three options are available:

Program Type: Each state's wetland protection activities has been divided into 13 "programs." These include such items as "Section 401" permitting, wetlands acquisition programs, wetlands research activities, and so on. Obviously, not all states have all 13 programs, so sometimes blanks will be present. These 13 programs are described more thoroughly below.

Program Attributes: Each of the 13 programs has a set of 22 descriptive terms about the program. We call these descriptive terms "attributes." These attribute categories are the same for all programs and all states, but again some programs in some states may have blanks for some (or most!) of the attributes. Some of the attributes are the name of the program, the legal or statutory authority, and a description of the wetland values protected by the program. These 22 attributes are explained more thoroughly below.

State: Each state's two-letter mail code is shown in this menu. No definitions are required for this menu.

"PROGRAM TYPE" DEFINITIONS

Acquisition. explains the actions the state is taking to acquire wetlands for the purpose of protecting or rehabilitating them.
Coastal Law. describes the wetlands protection programs related to coastal or tidal wetlands.
Drainage Regulation. explains the state rules related to the draining or filling of wetlands.
401 Permits. explains the rules of this water quality discharge permitting program as they relate to wetlands management.
Executive Orders. explains the content and effect of state executive orders on wetland management.
Floodplain Regulation. describes the role of these regulations on wetland management.
Inland Law. describes the wetlands protection programs affecting inland (non-coastal) wetlands.
Pending Legislation. outlines bills that were introduced during the 1986, 1987, and or 1988 legislative sessions.
Local Programs. describes significant local government wetland protection programs.
SEPA. describes the state's Environmental Policy Act, and its role in wetlands protection.

Taxation Programs. explains tax relief and other taxation programs designed to benefit wetlands.
Research. describes research projects at the state and university level related to wetland protection.
Other Programs. includes Coastal Zone Management, construction, dredging, water rights, etc. affecting wetlands.

"ATTRIBUTE" DEFINITIONS

Name of Program. lists the full name of the program.
Administering Agency. lists the name of the agency with primary responsibility
Implementation Method. explains main tool for program: assessments, permits, certifications, guidelines, etc.
Legal Authority. lists the state or federal statute, name of bill, or other authority for the program.
Resources. lists staff positions, funding and other related data.
Lands Covered. explains which lands are affected by the program.
Inventory and Classification. explains the effects of the program upon wetlands inventory and/or classifications.
Activities Regulated. explains which activities are covered by the program: state projects, private construction, projects above impoundments, etc.
Exemptions. lists activities that are exempted from the program: federal projects, agricultural, recreational, fish & game, etc.
Values Protected. explains what wetland values the program is trying to protect: water quality, water supply, wildlife, etc.
Compliance. describes the main compliance tools: public meetings, voluntary reporting, inspections, annual reports, etc.
Education. describes some of the techniques that are used to educate the regulated community or public about the program.
Problems. describes some of the problems/set-backs that the program has experienced: lack of enforcement, unclear jurisdictions, lack of guidance, etc.
EPA Role. explains what the U.S. EPA's role (if any) is in the process: oversight, technical guidance, joint meetings, etc.
Needed from EPA. assesses what the U.S. EPA might do to make the program more effective.
Taking Issues. presents a synopsis of the program's effect or perceived effect on imminent domain or land use planning issues which amount to a "taking" of someone's property.
Mitigation. explains what wetlands mitigation effects have occurred due to the program.
Cumulative Impacts. what the long-term beneficial (or harmful) effects of the program has been towards wetland protection.
Wetland Functions. presents a summary of effects on or improvements to wetlands functions.
Other Comments. lists some general comments that did not fall into one of the other attributes.

BOOLEAN OPERATORS

The Boolean operators AND and OR are the most common but there are many more. CSG recommends that users limit themselves to AND and OR, but some of the other possibilities are: BOTH, NOR, and NOT.

"AND" generally means that both the first AND the second argument must be present for the data to show up. "AND" thus usually results in smaller sets of data.

"OR" generally means that either the first OR the second argument needs to be present for the data to show up. "OR" thus usually results in larger sets of data.

Sometimes operators can be combined. For example, AND NOT means to look for the first term, but not the second term.

QUICKSTART SUMMARY AND REFERENCE PAGE

1. Call (606) 254-3612 to log-on. Set modem at 1200,N,8,1.
2. Press the Return/Enter key once or twice after connect, if necessary.
3. Log-on to: Username: wetlands
   Password: wetlands
4. Wait for messages and WETLANDS Main Menu.
5. Select WCON (directory of contacts) or WPRO (state program info) Databases.
6. Select a numbered item from the Search Menu.
7. Press X and Return to execute the search.
8. Press DI and Return to display the data.
9. Press LO and Return to end session on Search Menu, and L to end session on Main Menu.

REGISTRATION INFORMATION

If you think you or your staff will be a regular user of WETLANDS, then we ask that you register to get your own ID (Username). You will also be assured of automatically receiving Database Updates as they occur.

It costs nothing but a postage stamp to register!

Use a copy of the following form to register. Only one registration per office is necessary.

Name____________________________________Title_____________________

Organization____

Address____
____

City____________________________________State_______ZIP___________

Phone (_____)______________

Type of Terminal(s) (List all applicable types):

Computer brandname:____

Modem name and baud rate:____

Type of Organization (Circle all applicable):

Government: State Federal Local

University

Public Interest Group

Association: Trade Non-profit

Other (describe)____

Username:________________________Password:___________________________

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The Council of State Governments is a non-profit, non-partisan service organization of all 50 state governments – created, supported, funded and directed by them. The states established the Council in 1933 to improve the state governments and strengthen the state role in the federal system.

The Council conducts research on state programs and problems; maintains an information service available to state officials; issues a variety of publications; assists in state-federal liaison; promotes regional and state- local cooperation; and provides staff for affiliated organizations.

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The Center for the Environment and Natural Resources

The Center for the Environment and Natural Resources (CENR) was established by CSG to assist state leaders in environmental policy. CENR is part of the Council of State Governments, and is guided by a Policy Steering Committee of senior state legislators and executive branch officials from all regions of the country.

Focusing on state program and policy options, the Center helps states to share information, resources, and ideas; prepares model state programs and suggested laws; hosts working sessions among state, public, and private sector leaders to develop and recommend joint solutions to problems; researches issues identified by its members; offers states a central referral service; and identifies and articulates key state problems and solutions. In addition to these services, CSG's Centers inform state policy makers through publications on state policy initiatives, including reports, briefs, and survey data; trains and develops state officials on issues and policies; and holds timely regional and national forums on problems and solutions.

For further information:

Mr. R. Steven Brown, Director
Center for the Environment and Natural Resources
P.O. Box 11910
Lexington, KY 40502

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State Infectious Waste Regulatory Programs. (C-108) $20. 16 pages. State officials — 30% discount.

The Council of State Governments, Iron Works Pike, P.O. Box 11910, Lexington, KY 40478-9989, (606) 262-2291.

*Call or write CSG's Center for Environment and Natural Resources for hardware and software requirements.

Attachment J

RIPARIAN AND WETLAND CLASSIFICATION REVIEW

RIPARIAN AREA MANAGEMENT

TR 1737-5 1990

Riparian and Wetland Classification Review

U.S. Department of the Interior

Bureau of Land Management

Copies available from:

Bureau of Land Management
Service Center
SC-657B
P.O. Box 25047
Denver, Colorado 80225-0047

BLM/YA/PT-91/002+1737

RIPARIAN AREA MANAGEMENT

Riparian and Wetland Classification Review

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Technical Reference 1737-5
1990

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Riparian and Wetland Classification Review

I. Introduction

In recent years a large number of riparian and wetland classification and description procedures have been developed and/or modified by many investigators. Riparian and wetland managers have seen this myriad of procedures and basically have been confused about which one to use and what they are supposed to do. The following riparian and wetland classification and description procedures were selected for review from a very lengthy list because they have one or more of the following characteristics: they are regional or national in scope; they provide management information; and they integrate stream attributes and riparian vegetation.

1. SCS-BLM Standard Ecological Site Description.
2. Southwestern Wetlands — Their Classification and Characterization.
3. The Canadian Wetland Classification System.
4. Riparian Zone Associations of the Deschutes, Ochoco, Fremont, and Winema National Forests.
5. Classification and Management of Riparian and Wetland Sites in Montana.
6. Classifying Rangeland Riparian Areas: The Nevada Task Force Approach.
7. Classification of Riverine Riparian Habitats for Management of Fisheries Resources.
8. An Ecological Characterization of Rocky Mountain Montane and Subalpine Wetlands.
9. Ecosystem Classification Handbook.
10. Classification of Wetlands and Deepwater Habitats of the United States.
11. Riparian Community Type Classification of Eastern Idaho-Western Wyoming.

II. Purpose

It is the policy of the Bureau of Land Management (BLM) to apply the Standard Ecological Site Description procedure patterned after the Soil Conservation Service (SCS) Range Site procedure and expanded by the BLM (USDA-SCS 1976, USDI-BLM 1990) to grazable woodland, native pasture, and riparian sites. However, other classification and description procedures exist and often must be used to make use of all available information or to coordinate between other agencies and institutions during riparian and wetland inventory. This document introduces major concepts relevant to the understanding of riparian systems and reviews selected riparian and wetland classification and description procedures. This document also provides a means of relating the various procedures. Appendix A contains a crosswalk of those reviewed classification and description procedures that can be readily applied to riparian site descriptions and concepts of vegetation succession and site progression discussed below. Appendixes B-E provide information and define terminology that should help in understanding and applying classification and description procedures.

III. Vegetation Succession and Site Progression

Succession usually represents an orderly progression (except in cases of fire, etc.) of plant community change, towards a relatively stable state often termed the "potential natural community" (PNC) or "potential plant community" (PPC). These changes in plant communities may also accompany important refinements in certain environmental characteristics, such as physical properties (e.g., organic material in the soil), soil chemistry, soil moisture, understory solar radiation, root distribution, populations of insects and animals, and appearance. These changes are often made possible through the behavior of the site's environment (particularly soil and water). The ability to discern these environmental factors from one site to another is a basis for ecological classification. Often, the plant community is used as an indicator of these integrated environmental factors.

Currently, the most frequently used procedure of classifying community ecology follows the concepts introduced by Daubenmire (1959). Many recent authors have used these concepts in their work with riparian and wetland environments (Youngblood et al. 1985, Kovalchik 1987, Hansen et al. 1988, Hansen 1989, Szaro 1989). These authors demonstrate that the concepts of succession used in upland environments are equally applicable to riparian systems, although the riparian site is generally much more dynamic. It is useful in further comparison and discussion to review some of the basic terminology and concepts applied in these recent documents:

> Association - In normal usage, an association is a climax community type or potential plant community. In riparian systems, because of their dynamic nature, a true climax community may not have an opportunity to occur (Youngblood et al. 1985). An association for a riparian environment is therefore a plant community type representing the latest successional stage attainable on a specific hydrologically influenced surface (Kovalchik 1987, Hansen 1989). Hansen (1989) uses the term "riparian association" while Youngblood et al. (1985) chose the term "potential stable community type" that approaches an association.
>
> Community Type - This is defined as an aggregation of all plant communities in some procedures, or as existing/dominant plant communities in others. Community types are distinguished by floristic and structural similarities in both overstory and undergrowth layers. Community types are considered to represent seral stages.
>
> Site Type - This is the area of land occupied or potentially occupied by a specific association. Site types that were the same would have similar environments that could develop the same potential plant community. Hansen (1989) uses the term "riparian site type" when describing a site capable of producing a "riparian association."

Figure 1 offers two similar views of successional concepts. Hansen (1989) provided an illustration, shown in part a of Figure 1, to depict the relationship between site type, community type, and association.

The illustration shows that community types are seral to associations (potential natural communities) and that some community types are common to one or more associations. It also shows that one site type (range type in part b of Figure 1) supports one association (PNC).

In many riparian systems there is a high potential for physical environments to undergo sudden and/or extreme changes because of the potential for soil erosion, deposition, and changes in water availability. Youngblood et al. (1985) stated "Directional processes from one community type to another indicate succession; we have not attempted to indicate the many possible relationships resulting from retrogression." This acknowledges succession and the complexity of possible community types due to site change. To help emphasize that these changes are the rule rather than the exception in riparian environments, we have introduced the term "site progression" which denotes major changes in the site. Site progression is not intended to diminish or replace any of the concepts of community succession; rather, it is a term to help those less familiar with the dynamics of riparian systems focus on the expectation for site change. Generally, site progression can be thought of as a site change which may result in a different potential natural community for the site. An example of this would be a site located on a flood plain consisting of fine substrate that undergoes extreme incisement, eventually changing the site from a moist to a very dry environment. The site progression is also seen in the succession of a gravel bar to an eventual nonflooded, cottonwood dominated terrace. In Figure 1, site progression would be seen as a site change between columns of the site types (riparian and/or habitat types) or cones. Figure 2 is a representation of site progression.

Additionally, for a classification or site description to be very useful to management it should recognize and discuss site succession, site progression, and site potential and what makes them occur, thereby offering managers a means for rational management.

> "It is important to remember that not all the landscape is at its potential. In fact, only relatively small amounts are. However, by knowing what the potential is, a manager can understand the processes and how to best manage for them." (Paul Hansen, pers. commun.)

We refer to this as an understanding of "process pathways." Once the process pathways are recognized, management can better understand cause and effect relationships.

IV. Riparian Health and Ecological Site Status

Riparian health has been related to ecological site status in recent years. This is a dangerous and functionally impossible view of how riparian systems operate. The following paragraphs discuss the concepts of ecological site status and riparian health in hopes that a more clear understanding of riparian system function will result.

Ecological site status refers to the position on a successional pathway that a particular site may be in. For example, a newly vegetated gravel bar may be covered with pioneering plant species such as cottonwood and willow. This site is said to be in early seral stage because it is at the beginning of its successional pathway. It is also in a frequently flooded state, allowing deposition interspersed with scoured flow patterns. As vegetation succession occurs and aggradation continues, young cottonwood trees may dominate an understory adapted to frequent or occasional flooding. As long as the relationship with flooding frequency and timing is maintained to allow cottonwood regeneration (not allowing the young cottonwoods to effectively trap sediments or become older), vegetation succession cannot proceed and could be considered in an advanced stage for that particular set of physical circumstances. However, if aggradation has occurred far enough (which may be directly related to the presence of the cottonwoods) or stream channel migration relegates the site to a rarely flooded or nonflooded state, the cottonwoods may persist to a decadent stand. Regardless of the longevity of the cottonwoods at this location, site progression has evolved to a new state allowing vegetation succession to proceed to a new potential dominated by ash or perhaps

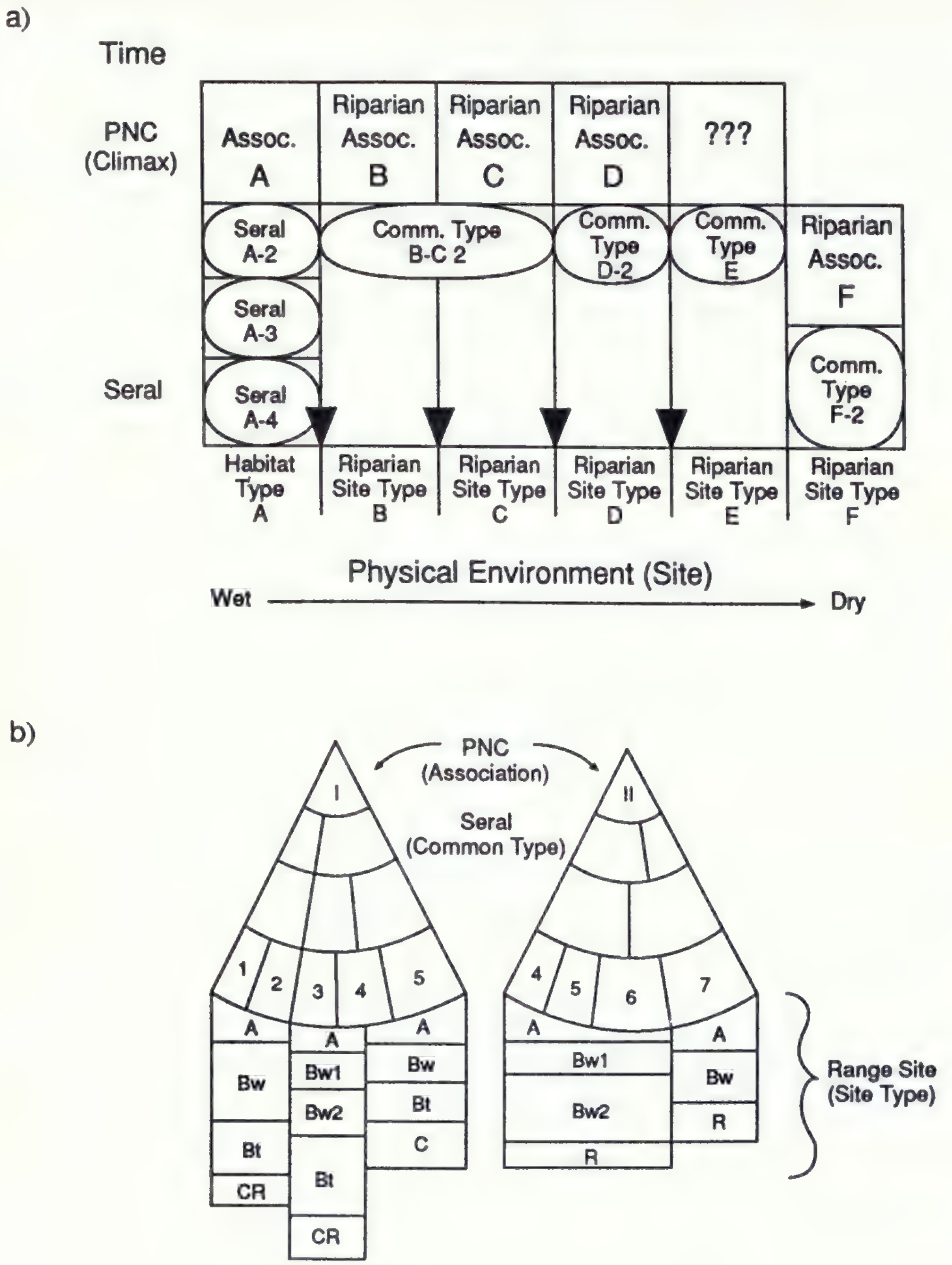
a)
Time
PNC (Climax)
Assoc. A
Riparian Assoc. B
Riparian Assoc. C
Riparian Assoc. D
???
Seral A-2
Comm. Type B-C 2
Comm. Type D-2
Comm. Type E
Riparian Assoc. F
Seral A-3
Seral
Seral A-4
Comm. Type F-2
Habitat Type A
Riparian Site Type B
Riparian Site Type C
Riparian Site Type D
Riparian Site Type E
Riparian Site Type F
Physical Environment (Site)
Wet
Dry
b)
PNC (Association)
I
II
Seral (Common Type)
1
2
3
4
5
4
5
6
7
A
Bw
Bt
CR
A
Bw1
Bw2
Bt
CR
A
Bw
Bt
C
A
Bw1
Bw2
R
A
Bw
R
Range Site (Site Type)

Figure 1. Comparison of Two Successional Models. a) Illustration of classification terminology as it relates to time and the physical environment (site) for riparian areas, after Hansen (1989). b) Conceptual "cone" model of secondary successional plant communities developed by Huschle and Hironaka, and Neiman, Jr. and Hironaka, modified to illustrate terms as shown in "a" above, and those typically used within range site descriptions. Depicted are two range sites, seral plant communities, and range site specific soil units. Note seral plant communities 4 and 5 can occur in two sites having different potential natural communities (potential plant communities).

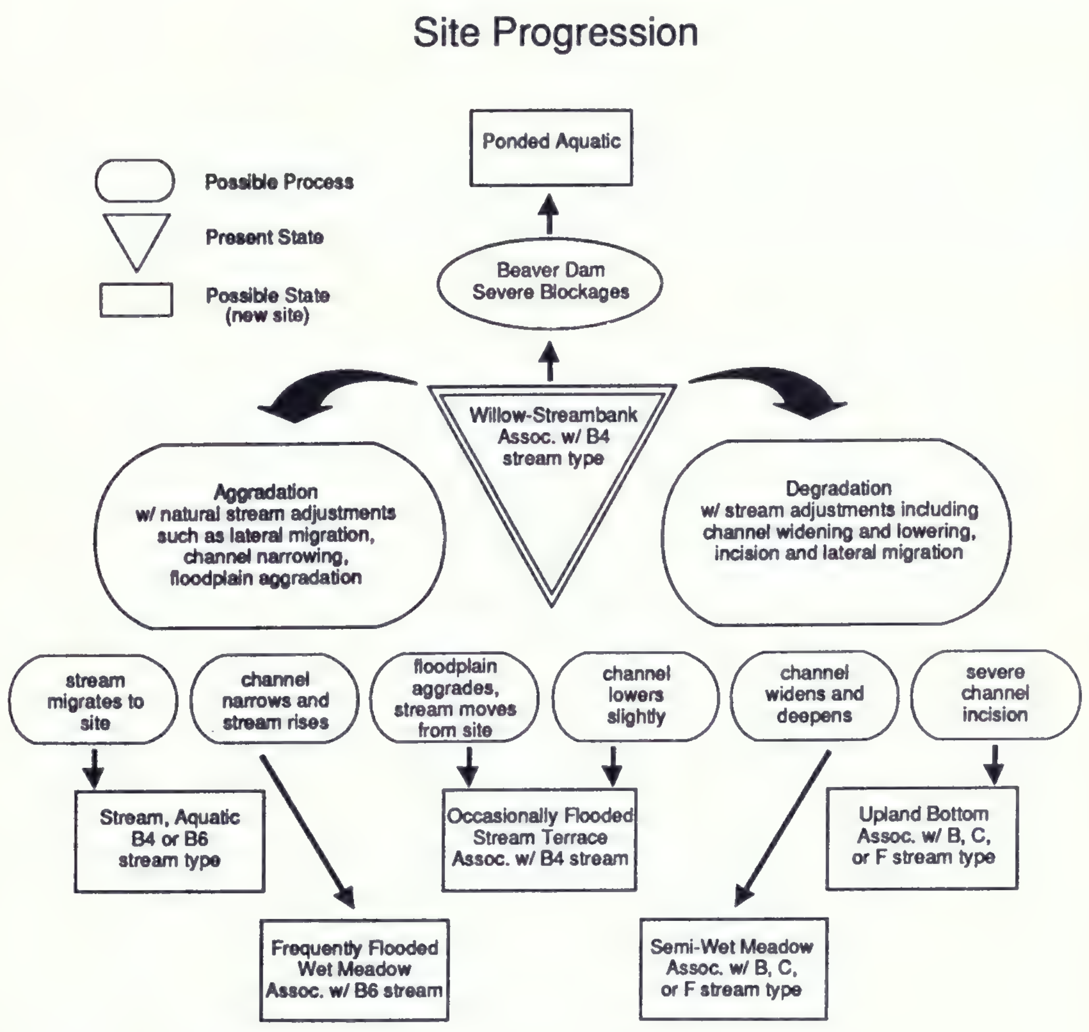
Site Progression
Possible Process
Present State
Possible State (new site)
Ponded Aquatic
Beaver Dam Severe Blockages
Willow-Streambank Assoc. w/ B4 stream type
Aggradation w/ natural stream adjustments such as lateral migration, channel narrowing, floodplain aggradation
Degradation w/ stream adjustments including channel widening and lowering, incision and lateral migration
stream migrates to site
channel narrows and stream rises
floodplain aggrades, stream moves from site
channel lowers slightly
channel widens and deepens
severe channel incision
Stream, Aquatic B4 or B6 stream type
Occasionally Flooded Stream Terrace Assoc. w/ B4 stream
Upland Bottom Assoc. w/ B, C, or F stream type
Frequently Flooded Wet Meadow Assoc. w/ B6 stream
Semi-Wet Meadow Assoc. w/ B, C, or F stream type

Figure 2. Concept of Site Progression. The boxes represented as "states" may include a number of different site types and may be found associated with stream types (i.e., B4, B6, etc.) as described by Rosgen (1985).

other self-perpetuating species. The decadent cottonwood stand is now an early successional stage to a different potential natural community. Vegetation succession may or may not be allowed to proceed long enough to reach that new potential, depending on stream dynamics and hydrology in relation to the valley bottom morphology.

Since riparian systems are dynamic, some may never be able to attain a climax community, or at least not attain it without long term evolution of existing valley bottom morphology. A stream flood plain developing within the walls of a past incisement provides such an example. The soil-water-plant relationships within the developing flood plain may provide the same wet meadow/meadow complex of site potentials as found elsewhere. The stream channel may be aggrading at approximately the same rate as the adjacent flood plain. Site progression, in this case, is actually increasing the aerial extent of the riparian vegetation (and associated ground water) as the system aggrades. The system is in an excellent functional state. However, the forming and reforming of plant communities due to the increased frequency of deposited sediments limits vegetation succession to early and mid-successional status. This will be the case until the geomorphic processes of aggradation slow sufficiently to allow vegetation succession to proceed.

Riparian health must be viewed with the understanding that the riparian system is inherently dynamic. The condition (abundance, vigor) of the vegetation on a site would be only one attribute of riparian health. The riparian health should be evaluated in terms of physical and biological function in relation to the *entire watershed.* The following excerpts from Gebhardt et al. (1990) introduce this concept:

> "The interaction of watershed characteristics and vegetation can be described in terms of physical and biological processes and factors. Such processes and factors can be grouped by physical and biological characteristics. The U.S. Fish and Wildlife Service (1989) identified the major vegetal biological characteristics or responses as survival-maintenance, recruitment-reproduction, and community dynamics. The major physical characteristics follow the watershed characteristics described above grouped as moisture/inundation (water quantity), physical and chemical water quality, transport/deposition, and channel/floodplain geometry. Our responsibility is to understand their importance to the riparian system, particularly in terms of their rates, magnitude or extent, and duration."

The processes and associated factors controlling riparian function are listed in Appendix F.

Riparian health should not be confused with ecological site status. A young site or an old site can be in good health, as with any organism. However, one should not assume that a stream in an advanced ecological condition is desirable (or even attainable) in all instances. Some sites, for example, may be at an early or mid-seral ecological status and provide wonderful waterfowl habitat. Provided these sites are in good health, they are serving a very positive function. Another example might be a willow-dominated PNC supporting a trout population. At the PPC and in excellent health, such a site might produce an abundant fish population, but the vegetation density would preclude fishing.

In summary, riparian health and ecological site status are two different characteristics of riparian systems. A site in any ecological status may be in good or poor health. All sites should not necessarily be managed for late seral condition, particularly if it precludes a desired function or beneficial use. Riparian health should be judged on the functions that it provides compared to functions that should be present in relation to the entire watershed. All riparian systems should not be expected to have identical functions.

V. Review Format

Each classification and description procedure included in this technical reference is described and discussed using the following standard format:

Name: Name of the classification or description procedure.

Authors: Authors and/or agencies preparing the procedure.

References: Documents that explain the procedure.

Objectives: Describes the major objectives of the system or procedure as given or estimates the objectives based on contents of the reference.

Designed Users: Estimates likely users of the system.

Area of Applicability: Region, state, or locality where the procedure appears or is proven to be able to work. No discussion on scale is given. The procedures described can be used at about any scale. The size of the areas depicted in the classification will be dependent on the purpose of the classification which will define the detail of the mapping units and the sorting process used to aggregate and separate.

Classification Units, Description, and Data: Units or major contents or data requirements of the classification are given in order of a hierarchical structure, where given, otherwise they will be placed based on the best estimate of the reviewer.

Use, Testing, Validation: Information on use is given, particularly in reference to large-scale testing or validation efforts.

Ease of Application: An estimate is given on how easily the procedure could be applied by professional land resource specialists.

Use in Defining System Response and Potential: System response is the response of a riparian or wetland to various environmental change. Potential refers to the potential natural community as described above. Classification and description procedures may simply provide a method of categorization without regards to environmental response. However, without some ability to define the response and potential, a classification procedure cannot relate to management very effectively. Ties to system response might include both physical and biological factors providing clues to a system's limiting factors such as soil-water regime, substrate, riparian-riverine interaction, channel morphology, flora, and fauna.

Use in Determining State of System: A discussion is included on the procedures handling of succession and site progression, the concepts of which are explained above.

Relation to Other Procedures: Well-known procedures or standards are given if they are known to have been used in the development.

Automated Data Processing (ADP): Where ADP applications have been built for the procedure, they are mentioned.

Limitations and Assumptions: Perceived limitations in accomplishing objectives are given. Assumptions inherent in the procedure are given if they are considered significant.

VI. Classification and Description Procedures

1. Name: SCS-BLM Standard Ecological Site Description.

Authors: Soil Conservation Service, Bureau of Land Management.

References: U.S. Department of Agriculture. 1976. National Range Handbook, as amended. Soil Conservation Service, Washington, DC.

U.S. Department of Interior. 1990. National range handbook. BLM Manual Handbook H-4410-1. Bureau of Land Management, Washington, DC.

Objectives: The National Range Handbook (SCS) as supplemented by BLM Manual Handbook H-4410-1 National Range Handbook includes procedures for preparing standardized ecological site (range site) descriptions. The National Range Handbook provides for range site descriptions that include a unique name, physiographic features, climatic features, vegetation ecology and production, soils, and management interpretations (which can be used in making management recommendations). BLM Manual Handbook H-4410-1 further provides that the concept also applies to grazable woodlands, forest and riparian/wetland sites.

Early in 1988, BLM determined that the standard site description procedures contained in the National Range Handbook as applied to uplands would accommodate land features associated with riparian and wetland sites as well. These procedures were modified by adding riparian and wetland associated water features and additional descriptions of site dynamics to the standard site description format and the Siteform program.

Designed Users: All levels of land users.

Area of Applicability: Universal application to rangeland, woodland, and native pasture.

Classification Units, Description, and Data:

Classification Units	**Description**
Physiographic Features	Occurrence of the site in the landscape. Degree and direction of slopes. Range of elevation.
Climatic Features	Range in average annual precipitation, temperature, and seasonal distribution. Average beginning and ending dates of growing season for major native forage species. Other features such as storm intensity, wind velocity, and drought cycles that typify the site and may contribute to or limit its potential.
Vegetation Ecology	Description of the plant community that would become established if all successional sequences were completed without major disturbance under similar environmental conditions (assuming no major site changes such as seen

	with site progression). Concepts of potential plant community, seral ecological status, and seral community apply to this procedure. List of major plant species and their normal relative proportion in the total natural plant community. Other features, if deemed significant, such as ground cover, plant spacing, and overstory canopy. Descriptions of additional communities that may occur on the site under various stress and/or at different successional stages. Estimated total annual production and range in favorable and unfavorable years.
Soils	Briefly describes the main properties of the major soils associated with the site with special significance on important soil-vegetation-water properties. Name of major soils and their respective phase associated with the site.
Associated Water Features	Includes information on the morphology and hydrology of associated water system. Typical attributes include stream type (Rosgen 1985), flow regime, erosional/depositional features, surface and ground water features.
Site Interpretation	Information on potential importance of the site for each of its major uses. Includes successional stages and potential to change characteristics (stability) or to change states.
Identification Authentication	Gives location of typical example of the site. Identifies site with the Major Land Resource Areas (MLRA) in which it occurs. Gives information of when the description was approved and the principal author and agency.

Use, Testing, Validation: The procedure in the National Range Handbook is used worldwide to prepare site descriptions for rangelands. These procedures have been modified, tested, and validated for use in preparing site descriptions for riparian areas. Procedures for site correlation exist and are compatible with the National Soil Handbook.

Ease of Application: Ease of application depends on the ability and experience of the users. A team of specialists consisting of a biologist, botanist/ecologist, soil scientist, and hydrologist is required to use these procedures on riparian and wetland sites. The procedures for mapping, delineating, describing, and interpreting sites have been used by several agencies for several years. Sufficient training, review, and correlation is key to the success of the procedure.

Use in Defining System Response and Potential: A major purpose of the procedure is to define community response and the reasons why a particular response occurs.

Use in Determining State of System: The procedure is well suited to identify changes of state and the reasons for site progression (aggradation/degradation).

Relation to Other Procedures: The procedure makes use of other nationally or internationally recognized procedures, such as the National Soil Handbook. It is conceptually similar to others in recognizing a potential or climax plant community and successional stages or communities.

Automated Data Processing: Several levels of data processing assistance are available for the procedure.

Limitations and Assumptions: Use of this procedure is limited by the extent of knowledge of similar sites and by the expertise of the users. Experienced personnel are required to correctly identify site potential. The end product of the procedure is a very useful document for management.

2. Name: Southwestern Wetlands — Their Classification and Characterization.

Authors: David E. Brown.

References: Brown, D.E. 1978. Southwestern wetlands — their classification and characterization. *in*: Proceedings of the National Riparian Ecosystems Symposium, Callaway Gardens, Georgia, Dec. 11-13, 1978. pp. 269-282.

Brown, D.E. and C.H. Lowe. 1973. A proposed classification for natural and potential vegetation in the Southwest with particular reference to Arizona. Ariz. Game and Fish Dep., Fed. Aid Proj. Rpt. W-53-R-22 WP-4JI:1-26.

Objectives: Provide a hierarchical structure for the world's biotic communities based on those factors most important in the evolution of origin, structure, and composition of all ecosystems, both wetland and terrestrial. Recognizes plant components within an assigned ecological distribution and could lead to the species of wildlife expected to be present.

Designed Users: Ecologists, wildlife biologists, zoologists.

Area of Applicability: Everywhere.

Classification Units, Description, and Data:

Classification Units	**Description**
Biogeographic Realm	Geographic and biologic origin-evolutionary boundaries. Generally very large with the exception of small areas showing high degree of endemism. Seven realms are used: Nearctic (Continental North America exclusive of the tropics and most highland areas south of the Tropic of Cancer); Palaearctic (Eurasia exclusive of the tropics); Neotropical and Antarctican; Oriental; Ethiopian; Australian; Oceanic.
Vegetation	Classed as either upland wetland, or in the case of altered lands, cultivated. All existing and potential natural vegetation are placed in these classes.
Formation Type	Refers to recognized ecological formations (biome interpretation types). Wetland formation types include wet tundra, forest, swampscrub, marshland, strand (unvegetated bank or shore), and submergent.
Climate Zone	Refers to one of four world climate zones (arctic boreal, cold temperate, warm temperate, tropical-subtropical).
Regional Formation	Refers to a subcontinental unit that is a major biotic community (biome) usually centered in but not restricted to a biogeographic region or province possessing a particular precipitation pattern or other climatic regime.

Series	Provides the principal or plant-animal communities within general biomes, recognized and distinguished primarily on distinctive climax plant dominants. These series sometimes referred to as cover types or vegetation types are each composed of one or more biotic associations characterized by shared climax dominants—within the same formation, zone, and biome.
Association	Refers to distinctive plant associations based on the occurrence of particular dominant species more or less local (or regional) in distribution and generally equivalent to habitat types as outlined by Daubenmire and Daubenmire (1968), Layser (1974), and Pfister et al. (1977).
Composition-Structure-Phase	Is a qualitative description of the structure composition, density for the dominants. Most detailed.

Use, Testing, Validation: The reference for this classification system is preceded by many other references (Brown 1973; Brown and Lowe 1973; Brown and Lowe 1974a, b; Brown, Lowe, and Pase 1977) to the extent it should be considered well tested. There was little information sought on its use; however, it is assumed to be in use in the Southwest.

Ease of Application: Half of the categories are developed from existing information. Field work is necessary to classify below the series level and also would be required at the series level in areas where vegetation is not generally identified.

Use in Defining System Response and Potential: The hierarchy of the procedure allows for very general climatic consideration and general animal habitat consideration. The procedure does not deal with geomorphic processes or riverine environments. However, this information could be incorporated easily.

Use in Determining State of System: The state of the system appears inherent at the association level in this procedure. The state of a system in regards to site succession and site progression may be identified, but is not recognized as a part of the procedure.

Relation to Other Procedures: This procedure has placed reliance on existing classification procedures for zoogeography, world climates, wetland determination [through SCS hydric procedures (assumed but not stated in document), world vegetation-habitat zones, and finally successional vegetation procedures of Daubenmire creation].

Automated Data Processing: The procedure was set up in a numeric fashion to facilitate data processing. It is not known whether this procedure has an established data standard through any Federal or State agency, however.

Limitations and Assumptions: This procedure stresses the importance of evolutionary origin and regional adaptation. The upper portions of the classification may have value to the manager concerned with importing exotic species, recovering native species, and identifying potential zones for adaptation. The lower portions of the classification are very similar to many others' procedures and should provide suitable data at a more site or habitat specific level. The classification does not provide physical process information nor was it intended to; however, this does not preclude more elaboration on the user's part.

3. Name: The Canadian Wetland Classification System. Provisional — this system is currently being revised and should be released in 1990 (Clayton Rubec, pers. com.).

Authors: National Wetlands Working Group, Canada Committee on Ecological Land Classification.

Reference: National Wetlands Working Group. 1987. The Canadian wetland classification system (provisional edition). Lands Conservation Branch, Canadian Wildlife Service, Environment Canada, Ecological Land Classification Series No. 21. 18 pp.

Objectives: Develop nationally applicable wetland classification system.

Designed Users: Biologists, managers.

Area of Applicability: Canada.
Classification Units, Description, and Data:

Classification Units	**Description**
Class	Five wetland classes are bog, fen, marsh, swamp, and shallow water.
Form	There are 70 wetland forms differentiated based on morphology, pattern, water type, and underlying soil.
Type	Wetland types are classified according to vegetation physiognomy. These include coniferous and hardwood trees; tall, low, and mixed shrub; forb; graminoid (grass, reed, tall rush, low rush, sedge); moss; lichen; floating and submerged aquatic; and nonvegetated.

Use, Testing, Validation: Procedure is provisional and in the testing processes.

Ease of Application: Procedure is very straightforward. Keys are provided within each class to help a user find the correct form.

Use in Defining System Response and Potential: Form keys contain some physical information that could be used in developing some system responses; however, the intention of the procedure was to strictly classify without addressing response.

Use in Determining State of System: Based on the form key, the descriptions given are very close to what might be considered a system state. However, the concept of succession and progression is not inherent to the procedure.

Relation to Other Procedures: The procedure utilizes standard soil taxonomy. No references to any United States standards could be found.

Automated Data Processing: The data that is collected during the wetland inventory and/or classification is entered into the Canadian Wetland Registry (Kroetsch et al. 1988). This registry system is a computerized data base holding wetland information on location, climate, chemistry, hydrology, soils, and vegetation community or composition.

Limitations and Assumptions: While some of process concepts are handled in the form key, the classification does not attempt to educate the user in why the forms occur. The classification system is meant to be a complimentary text to National Wetlands Working Group, Canada Committee on Ecological Land Classification (1986), entitled "Wetlands of Canada," a definitive knowledge base on Canada's wetlands which serves as both an educational and management reference.

4. Name: Riparian Zone Associations of the Deschutes, Ochoco, Fremont, and Winema National Forests.

Authors: Bernard L. Kovalchik.

Reference: Kovalchik, B.L. 1987. Riparian zone associations: Deschutes, Ochoco, Fremont, and Winema National Forests. USDA Forest Service Region 6 Ecology Technical Paper 279-87 Pacific Northwest Region, Portland, Oregon. 171 pp.

Objectives: This product describes the general geographic, topographic, edaphic, functional, and floristic features of riparian ecosystems. It describes successional trends and predicts vegetative potential on disturbed riparian ecosystems and presents information on resource values and management opportunities. It contributes to the broad regional classification program of the USDA Forest Service, Region 6.

Designed Users: Biologists, foresters, range conservationists, engineers, hydrologists, managers.

Area of Applicability: Central and southern Oregon. Concepts of this system can be applied anywhere.

Classification Units, Description, and Data:

Classification Units	**Description**
Upland Ecosystem, Transitional Ecosystem, Riparian	While not actually classified, a distinction is made between upland, transitional, and riparian ecosystems. Riparian ecosystems are those next to water where vegetation is on the perpetual water source. Transitional ecosystems occur between the riparian and upland. Transitional ecosystems do not have mesophytic vegetation such as alders, sedges, and willows, yet are markedly different from the uplands. Transitional areas include inactive flood plains, terraces, toe-slopes, and meadows having high water during a portion of the year.
Physiographic Area	This is the broadest level of the classification and integrates similar climatic, geologic, and geomorphic processes.
Riparian Landform	This intermediate level reflects similarities in elevation, valley gradient, fluvial processes, water regime, and soils.
Riparian Association, Community Type, Fluvial Surface	This is the lower level and is determined by site environments reflected in the types of vegetation potentially dominated by the site. Riparian associations (or community types) differ from each other with respect to land management opportunities, can be identified at any level of disturbance, have a limited variation in species composition, and have a limited variability in productivity. The riparian

association is assumed to be the stable plant community on a particular site provided no major changes in the fluvial surface or water regime occur. Essentially, a community type may be a subset of a riparian association and may develop into a riparian association through normal successional stages of development. A community type (as described, and not one specific site) may also be seral to several riparian associations.

Other Attributes	Additional modifiers include soils, climate, and management information. Management information includes livestock, wildlife and fisheries potential, fire effects, silvicultural production and considerations, potential and pathways for recovery, and related studies.

Use, Testing, Validation: The publication is, in itself, a test and validation. The document is very useful. It includes several keys to define associations and communities from vegetation and landforms. The classification has been in use for 3 years and is well received by U.S. Forest Service managers (Kovalchik, pers. com.).

Ease of Application: The procedure is straightforward. Its ease of application is probably dependent on the experience of the field personnel doing the vegetation mapping and identification. The geomorphic-based alternative for predicting vegetation potential has proved effective for managers without taxonomic skills.

Use in Defining System Response and Potential: The procedure requires some thought to produce system response estimates. Geomorphology, at the landform level (64 landform cross-sections given) along with the geomorphic key to vegetation potential can be very useful in defining system response and is one of the best features of the publication.

Use in Determining State of System: The procedure determines associations (i.e., site succession). Reference are made to other potentials from the association descriptions based on changes in water regime, which is approaching the concept of states and site progression.

Relation to Other Procedures: This procedure relates to standard Daubenmire classification, and uses physiographic regions modified from Baldwin (1964) and Franklin and Dyrness (1973). Nothing limits this procedure from being used with the USFWS Cowardin et al. (1979) procedure; everything needed is supplied. It is also conceptually related to ecological site classification at the association/community levels.

Automated Data Processing: The procedure does not appear to be readily converted to a standard data base management system except at the landform level, which will easily fit into a geographic information system. The knowledge supplied in the descriptions would work well in an expert system type of environment.

Limitations and Assumptions: As presented, the author has done a superb job of getting to the manager's need.

5. Name: Classification and Management of Riparian and Wetland Sites in Montana.

Authors: Paul Hansen, Robert Pfister, John Joy, Dan Svoboda, Keith Boggs, Lew Myers, Steve Chadde, and John Pierce.

References: Batchelor, R., M. Erwin, R. Martinka, D. McIntosh, R. Pfister, E. Schneegas, J. Tayor, and K. Walther. 1982. A taxonomic classification system for Montana riparian vegetation types. Montana rural Area Development Committee, Bozeman, Montana. 13 pp.

Boggs K., P. Hansen, R. Pfister, and J. Joy. 1990. Classification and management of riparian and wetland sites in northwestern Montana, draft version 1, Montana Riparian Association, School of Forestry, University of Montana. 217 pp.

Hansen, P., S.W. Chadde, and R. Pfister, 1988. Riparian dominance types of Montana. Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, Montana. Misc. Pub. No. 49. 411 pp.

Hansen, P., K. Boggs, R. Pfister, and J. Joy. 1990. Classification and management of riparian and wetland sites in southwestern Montana, draft version 2a, Montana Riparian Association, School of Forestry, University of Montana. 292 pp.

Hansen, P., K. Boggs, R. Pfister, and J. Joy. 1990. Classification and management of riparian and wetland sites in central and eastern Montana, draft version 2, Montana Riparian Association, School of Forestry, University of Montana. 279 pp.

Objectives: Develop a riparian ecological site classification for Montana to assist in the identification, description, communication, and management of riparian areas by resource managers. Describe the general geographic, topographic, edaphic, functional, and floristic features of riparian ecosystems. Describe successional trends and predict vegetative potential on disturbed riparian sites. Present information on resource values and management opportunities. In addition, the classification can be used for mapping and inventory of the riparian zone.

Designed Users: Managers, biologists, hydrologists, engineers, resource specialists.

Area of Applicability: The approach is both a conceptual framework and an operational taxonomy that is applicable everywhere. The actual "types" described in the work are applicable to southwestern, central, northwestern, and eastern Montana.

Classification Units, Description, and Data:

Supplement to classification units: The ecological concepts and terminology used essentially follow the work of Daubenmire (1959), Daubenmire (1968), Daubenmire and Daubenmire (1968), Daubenmire (1970), Daubenmire (1978), and Kovalchik (1987). The hierarchical system is described by Daubenmire (1978). The following is a brief discussion of the hierarchical system.

Classification Units	Description
Region	Regions have a high degree of physiognomic uniformity among the climatic climaxes, and a gross similarity of climates throughout. However, taxonomic similarity is not a requirement.
Province	Provinces are zones in which the dominants of the climatic climaxes have had much the same geologic history, exhibit a strong thread of taxonomic continuity, and occur in climates of somewhat similar pattern. A finer subdivision of a province is a section.
Zones	Zones are the entire area over which zonal soils support what may be considered the same type of climatic climax. Zones are areas of essentially homogeneous macroclimate as indicated by a common climatic climax. The zones fit together on a map as a mosaic without overlap, although the plant association that is climatic climax in one zone usually occurs as an edaphic or topographic climax in a contiguous zone, where it becomes restricted to an environment which compensates for the relatively unfavorable macroclimate.
Series	A series is a group of habitat types having the same potential climax overstory.
Habitat Types	A habitat type is all the area of land capable of supporting the same climax plant association whether this be climatic, edaphic, or topographic climax. (A plant association is a kind of plant community represented by stands occurring in places where environments are so closely similar that there is a high degree of floristic uniformity in all layers.)
Phase	A phase is a subdivision of a habitat type representing a characteristic variation in climax vegetation and environmental conditions.
	Additional Ecological Terms
Riparian Association	A riparian association is a plant community type representing the latest successional stage attainable on a specific hydrologically influenced surface (equal to potential natural community). Because the riparian association is the end result of plant succession, it reflects the most meaningful integration of environmental factors affecting vegetation. [Because of the difficulties of defining climax in the classical sense for flood plain environments, this system currently follows the lead of Kovalchik (1987) in using the term riparian association to represent the latest successional stage available.]

Riparian Site Type	The riparian site type is the area of land occupied or potentially occupied by a specific riparian association (e.g., a vegetation based ecological site type for riparian areas). Each riparian site type represents a relatively narrow segment of environmental variation having a certain potential for vegetation development. Although any given riparian site type may support a wide variety of disturbance induced or seral vegetation, the ultimate product of vegetational succession anywhere within that riparian site type will be a similar plant community. Therefore, the riparian site type is an ecological site classification that uses the plant community as an indicator of integrated environmental factors as they affect species reproduction and plant community development.
Community Type	A community type is an aggregation of all plant communities distinguished by floristic and structural similarities in both overstory and undergrowth layers. Community types are considered to represent seral stages.

Site Descriptions

Location and Riparian Landforms	Presents typical elevation range and landforms associated with each type.
Floristic Characteristics of Sampled Stands	Describes the vegetation on the site.
Potential Natural Community	Used for seral stages (community types) and describes the proposed successional pathway(s) to the climax vegetation.
Soils	Follows standard SCS taxonomy and description of moisture regime.
Adjacent Communities	Describes adjacent wetter or drier sites. This information gives the user a mental picture of the "types" position on the landscape.
Management Information	The following management information is presented: livestock, timber, wildlife, fisheries, fire, soil management and rehabilitation opportunities, recreational uses and considerations. In addition, the following information (by species) is presented: 1) forage palatability (cattle, sheep, and horses), 2) energy value, 3) protein value, 4) thermal or feeding cover values (elk, mule deer, whitetail deer, upland game birds, waterfowl, small nongame birds, and small mammals), 5) food value or degree of use (elk, mule deer, whitetail deer, antelope, upland game birds, waterfowl, small

	nongame birds, and small mammals), 6) potential biomass production, 7) erosion control potential, 8) short-term revegetation potential, and 9) long-term revegetation potential.
Other Studies	Summary of similar sites.

Use, Testing, Validation: The approach is both a conceptual framework and an operational taxonomy that is applicable everywhere. The methodology is being used throughout Montana. The document provides managers with site potentials and management information.

Ease of Application: The procedure is straightforward. Its ease of application is dependent on the experience of the field personnel doing the vegetation mapping, identification, and interpretation.

Use in Defining System Response and Potential: The procedure's strength is in its attempt to understand system response and site potential for the purpose of providing management information.

Use in Determining State of System: A goal of the procedure is to identify associations (i.e., site succession). An effort was made to reference other potentials from the association descriptions based on changes in water regime.

Relation to Other Procedures: The procedure uses standard ecological classification principles. The ecological concepts and terminology used essentially follow the work of Daubenmire (1968), Daubenmire and Daubenmire (1968), Daubenmire (1970), Daubenmire (1978), and Kovalchik (1987). It is conceptually similar in part to ecological sites.

Automated Data Processing: The procedure uses the USFS Region 1 Ecodata sampling and automated data processing system. The results of the procedure would not be easily converted to a standard ADP system. However, it would work well in a knowledged based system (expert system).

Limitations and Assumptions: As presented, the authors have done a superb job of getting to the manager's need.

6. Name: Classifying Rangeland Riparian Areas: The Nevada Task Force Approach.

Authors: Sherman Swanson, Ray Miles, Steve Leonard, and Kenneth Genz.

Reference: Swanson S., R. Miles, S. Leonard, and K. Genz. 1988. Classifying rangeland riparian areas: the Nevada task force approach. Journal of Soil and Water Conservation, 1988. 43:3.

Objectives: Develop a system that is interdisciplinary, hierarchical, simple yet reliable, useful for management, related to ecological potential, and mappable.

Designed Users: Biologists, soil scientists, hydrologists, managers.

Area of Applicability: Rangelands, but concepts are applicable everywhere.

Classification Units, Description, and Data:

Classification Units	**Description**
Physiographic Region	Major land classes as defined by Brown and Kerr (1979).
Major Riparian Areas	Delineates between stream and nonstream types.
Stream Type	Stream types are classified using a geomorphic based system developed by Rosgen (1985).
Nonstream Type	Nonstream types include lake, reservoir, pond, pool, spring, seep, and irrigation conveyance.
Ecosystem - Riparian, Aquatic	Ecosystem is separated into either aquatic or riparian based effectiveness of the open water column. Aquatic ecosystems include nonpersistent emergent, aquatic beds, and areas not vegetated (bars). Cowardin et al. (1979) can be used to describe aquatic ecosystems at this point.
Subsystem	Only the riparian ecosystem is described in the subsystem. This includes moisture regime classes as suggested by Johnson et al. (1984): hydroriparian, mesoriparian, and xeroriparian.
Structure Class, Subclass	Structural class is similar to the Cowardin et al. (1979) class, but is related to perceived potential natural community. Structural classes include: forest, woodland, shrub, herb, nonvegetated. As with class, subclass attributes are based on potential natural community and include: evergreen, deciduous, mixed, tall, low, nonvegetated.

Ecological Site	A distinctive type of land that differs from other kinds of land in its ability to produce a characteristic potential natural community.
Community Type	The existing/dominant plant community distinguished by floristic and structural similarities.
Stream Subtype	Used under the associated stream type to describe in detail the stream reach being classified. The modifiers used by Rosgen (1985) are suggested to describe flow regimen, size, organic debris/channel blockages, depositional features, and meander patterns.
Naming Conventions	The physical site attributes are given in the beginning of the site name and are separated by a forward slash (/). The ecological site attributes are given on the right-hand side of the physical attributes and separated from them with a semicolon (;). Codominants are separated using a hyphen (-).

Use, Testing, Validation: Currently under testing through the University of Nevada, Reno.

Ease of Application: The system appears about as easy as any other procedure to apply. However, since it is more comprehensive than most procedures, there are more data requirements and may require more expertise.

Use in Defining System Response and Potential: The procedure has incorporated the concept of potential natural community, and as such, has recognized one form of system response. It has also incorporated a great deal of geomorphic information, making the tie between major physical systems more possible.

Use in Determining State of System: Procedure has all necessary components to determine site progression.

Relation to Other Procedures: To a large degree, the procedure maintains consistency with Soil Conservation Service standards for soil descriptions and to a lesser degree with the USFWS Cowardin et al. (1979) wetlands procedures. The procedure does deviate in naming conventions at the system, subsystem, and class level, but there are no major deviations in concept.

Automated Data Processing: The procedure is too new to evaluate, but does appear to be suitable to a data base management system.

Limitations and Assumptions: As written, the procedure is limited to inland areas; however, this could be expanded by following Cowardin et al. (1979) more closely. The naming convention may be too complex to allow for easy description and cross-referencing.

7. Name: Classification of Riverine Riparian Habitats for Management of Fisheries Resources.

Authors: William S. Platts, Sherman E. Jensen, Frank Smith.

Reference: Platts, W., S. Jensen, and F. Smith. 1988. Preliminary classification and inventory of riverine riparian habitats livestock/fishery study areas, Nevada. Progress Report I. Nevada Department of Wildlife, Elko, Nevada. 127 pp.

Objectives: Identify the existing state structure and function and their respective physical and biological processes. Identify the natural state under present set of conditions and the variability of this state over time. Estimate achievable state conditions and identify units of similar potential even though present states are not identical. Determine the state direction the system is moving (trends). Determine the time intervals occurring between state changes under known applications of stresses or benefits. Identify Poor and Best Management Practices. Determine limiting factors that determine the biotic carrying capacity for each state. Transfer knowledge and experience over space. Evaluate the influence of natural and artificial geomorphic-physical conditions within the watershed on the fisheries. Determine attainability (as described in the Water Quality Act) of riverine riparian habitats in a regional perspective. Allow valid establishment of control and treatment sites for assessing non-point source impacts to riverine riparian habitats. Display and describe riverine riparian habitats at selected hierarchical levels. Identify those variables that are sensitive for identifying and assessing non-point source impacts (monitoring). Be hierarchical and mappable. Display the regional characteristics of riverine riparian complexes and describe their inherent capabilities and potentials. The process must be amenable to hypothesis or model testing.

Designed Users: Biologists, hydrologists, engineers, managers, resource specialists.

Area of Applicability: Anywhere.

Classification Units, Description, and Data:

Classification Units	**Description**
Domain	Subcontinental area of related climates.
Division	A subset of domain delineating single reference regional climate as defined by Trewartha and Horn (1980).
Ecoregion	A subset of division based on land surface form as defined by Fenneman (1931). A broad vegetation region with the same types of zonal soils. Climatic climax at the level of Kuchler's (1964) potential vegetation types. Four major criteria are landform, potential natural vegetation, land use, and soil.
Geologic District	A subset of ecoregions delineating more homogeneous areas banding together uniform landforms at the level of Hammond's land-surface form regions.

Land Type Association	Groups of closely related types within a geologic district with recurring patterns of landforms, soil, and vegetation.
Land Type	Group of neighboring phases within a land type association with similar soil series or families with similar plant communities at the level of Daubenmire's (1968) habitat types (e.g., valley bottom).
Valley Bottom Class	Group of neighboring sites within land types having similar soil properties with closely related habitat types.
Riverine-Riparian Complexes	Repeating units within valley bottom classes that are made up of distinctive groups of riverine and riparian types.
Riverine and Riparian Community Types[1]	Repeating types within riverine and riparian complexes dictated by the location and combination of soils and water.
Riverine Site	What's at that final point (i.e., pool, riffle).
States	Are used to describe functional position within a number of major site environments for a particular piece of ground fixed in space and the cause/effect relationships that determine its position.

Ecological Considerations: Daubenmire concepts of succession, climax, ecological site are incorporated at the complex and community type level.

Use, Testing, Validation: The method has undergone testing and is now being applied in a regional scale to northern Nevada.

Ease of Application: The upper hierarchical data requirements are fairly easy to obtain though the use of existing resource information. The data requirements at the complex and community type level require field data collection similar to that required in most of the Daubenmire procedures. The site information can be as complex as the user wants to make it. The procedure would require personnel from several areas of expertise.

Use in Defining System Response and Potential: System response is a key element and one of the objectives of the procedure.

Use in Determining State of System: The state of the system is inherent in the procedure.

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[1] Riverine and riparian types are two distinct mappable uses, with riverine ecosystems being that within the channel.

Relation to Other Procedures: Vegetation classification followed is consistent with Youngblood et al. (1985). The procedure uses standard landform description, soil taxonomy, moisture regimes, and has flexibility to incorporate many types of attributes.

Automated Data Processing: Not easily converted to a standard ADP system. Would work well in a knowledge based system (expert system), however.

Limitations and Assumptions: The procedure uses such an integration of various hierarchical attributes that major limitations are unlikely. The procedure integrates both the riverine and riparian system as it is viewed in the upper and middle levels of the hierarchical structure.

8. Name: An Ecological Characterization of Rocky Mountain Montane and Subalpine Wetlands.

Authors: John T. Windell, Beatrice E. Willard, David J. Cooper, Susan Q. Foster, Christopher F. Knud-Hansen, Lauranne P. Rink, George N. Kiladis.

Reference: Windell, J., B. Willard, D. Cooper, S. Foster, C. Knud-Hansen, L. Rink, and G. Kiladis. 1986. An ecological characterization of Rocky Mountain montane and subalpine wetlands. National Ecology Center, Division of Wildlife and Contaminant Research, USDI, Fish and Wildlife Service, Washington, DC, Biological Report 86(11). 298 pp.

Objectives: Provide a comprehensive review of Rocky Mountain wetlands. Identify gaps existing in the scientific literature. Provide information for the assessment, planning, and permitting of activities affecting wetlands. Provide an educational source for anyone interested in the ecological functioning and value of high-elevation wetlands. The report also classifies Rocky Mountain wetlands within a system hierarchy that recognizes international wetland terminology, considers duration, depth, velocity of water and frequency of flooding, and variety and concentration of mineral nutrients as the two dominant factors determining pattern of species and communities.

Designed Users: Biologists, ecologists, planners, managers.

Area of Applicability: Rocky Mountains.

Classification Units, Description, and Data:

Classification Units	**Description**
Water Regime	Highest level of the classification and includes: permanent shallow, standing water; communities with seasonal or permanent high water tables, but without permanent standing waters; communities adjacent to running waters; communities in running water.
Subcategory	Permanent shallow, standing includes: floating, rooted submerged, rooted floating leaved, rooted emergent. Seasonal water regime: herb wetlands, shrub wetlands, forested wetlands, unvegetated. Running water regime: moss, herbaceous, shrub, forested, unvegetated.
Substrate	Mineral or organic.
Water Type	Fresh, saline, minerotrophic, ombrotrophic.
Ecosystem Type	Types listed to conform to international nomenclature: fen, bog, marsh-meadow, saline marsh-meadow, carr, shrub bog, shrub wetland, saline shrub wetland, deciduous angiosperm forest, moss wetlands, herbaceous wetland, shrub wetland, coniferous forest.

Fen	Sedge, grass, or reed-dominated minerotrophic peatlands. The water table is at, or close to, the surface most of the time. Minerotrophic means that the water source has been in contact with mineral soils and provides a much greater supply of nutrients.
Bog	A generalized term for a wetland that develops in a depression, such as a lake with poor drainage. Generally characterized by extensive peat deposits, acidic water, floating sedge, heath shrubs, and often the presence of coniferous trees. The water table is usually close to the surface without standing water (except where there are open ponds).
Marsh	A wetland on mineral soils dominated by herbaceous (nonwoody) plants, often developing in shallow ponds or depressions, river margins, tidal areas, and estuaries. Waters are not acid.
Meadow	Refers to herbaceous wetlands on mineral soil and may be synonymous with wet meadow. Generally occur in seasonally flooded basins and flats, and soils usually are not wet during the entire growing season.
Carr	Wetlands that occur on organic soil composed of minerotrophic peat, having greater than 25 percent shrubs that may form very dense cover creating thicket, or the overstory may be open. Usually there is abundant water that retards peat decomposition. Willow is common dominant in Rocky Mountain carrs.
Shrub Wetland	Wetlands dominated with shrubs found on either organic or mineral substrate. When on organic substrate with an ombotrophic water source (water source from precipitation which is also the major source of nutrients), they are called a shrub bog. When on organic substrate with a minerotrophic water source, they are considered a carr. When on mineral substrate with a fresh water source, they are called a shrub wetland, with a saline water source, a saline shrub wetland.

Levels below the subcategories are not formally defined, but are assumed to be similar to that of the USFWS (Cowardin et al. 1979) procedure.

Use, Testing, Validation: This procedure was intended to present a broad description of the wetland systems in the Rocky Mountains along with an abundance of supportive information on geology, climate, hydrology, and management. The document provides information into wetland ecology that is considered necessary reading to anyone attempting to describe or manage wetlands.

Ease of Application: The classification system appears fairly easy to apply; however, the entire report format is quite lengthy. The document as a whole is a tremendous characterization effort and would serve as a model for other ecoregions. A document similar to this would provide very helpful assistance to a more detailed classification.

Use in Defining System Response and Potential: The text of the document has a good discussion on system response at some levels but is inconsistent from type to type. The information provided would be useful in defining system response.

Use in Determining State of System: The chapter dealing with ecological process discusses theory and gives practical examples of system state change. The applications are broad, however.

Relation to Other Procedures: The document presents a table that cross-references other classification procedures. The procedure uses internationally recognized terms for wetland. As stated above, this document should be considered necessary reading to anyone attempting to describe or manage wetlands.

Automated Data Processing: The procedure as presented is not well-suited for ADP other than in a knowledge-based system.

Limitations and Assumptions: Classification nomenclature on an international level could be easily incorporated into many other procedures. Many of the concepts are presented throughout the document. The lack of an index makes rapid retrieval of such information difficult. The document does contain a great deal of information that should be reviewed by wetland classifiers and managers in understanding a broad overview of the landscape.

9. Name: Ecosystem Classification Handbook.

Authors: Wendel J. Hann and Mark E. Jensen.

Reference: Hann, W.J., and M.E. Jensen. 1987. Ecosystem classification handbook, Chapter 4 - Ecodata sampling methods. Region I, USDA, Forest Service. Missoula, Montana.

Objectives: The classification handbook is a total effort to integrate data inventory and analysis of terrestrial and riparian habitats and to combine this information into classification. The procedure is a means for the collection, management, and interpretation of data. Just about any taxonomical classification would be served by the ECODATA system.

Designed Users: Land managers and biologists.

Area of Applicability: United States (although system could be used anywhere).

Classification Units, Description, and Data:

The procedure reviewed did not include any typically hierarchical format, although the attributes collected during the inventory, the inventory design and mapping procedures, and the nomenclature all point to a very complete but flexible hierarchical structure. The units below are given in order of typically structured hierarchical procedures. Mapping terms are:

Classification Units	**Description**
Polygon	A contiguous unit of land which is delineated on a map or aerial photo within a closed boundary. Can contain similar or dissimilar strata.
Stand	A type of polygon which is designed to describe one dominant stratum type within a uniform environmental setting.
Stratum	A vegetation classification category defined at any level of resolution dependent upon classification needs. A vegetation type stratum contains all the land within a defined vegetation type. A community type stratum contains all the land within one particular seral or climax community type.
Complex	Where two or more dissimilar vegetation stratum are in the same stand (polygon) and each makes up greater than 20 percent of the stand area.
Inclusion	Where a dissimilar vegetation stratum comprises less than 10 percent of the stand or polygon area (vegetation).
Range Type	Delineation of major form type riparian and nonriparian (grassland, meadow, perennial forb, sagebrush, browse-mountain shrub, conifer, rock, broadleaf trees, badlands).

Ecosystem	All the land that has potential to produce similar structural life forms and has similar broad environmental characteristics (nonvegetated, conifer, juniper, shrub dominated wetland, grassland/grass-steppe/mountain grass).
Habitat Type	All the land capable of producing similar plant communities at climax. A habitat type name incorporates those plant species which best define the environment (typically two species). Habitat types sometimes are estimated since existing vegetation types may be seral because of disturbance.
Vegetation Type	All the plant communities that are similar with respect to both species type and abundance within all layers. Characterized by minimal variability in plant species composition.
Community Type	All the plant communities in which the dominant and/or indicator species of corresponding layers are similar.
Habitat Phase	A refinement of a habitat type in which additional indicator plant species are used to define a more narrow range of environmental conditions.

Physical Terms

Site Type	All sites possessing similar soil, parent material, slope position, shape, aspect, elevation, and climate.
Parent Material	Specific rock type.
Hydrologic Unit Code	USGS code for basin, sub-basin.
Stream Order	Standard Horton stream order.
Valley Bottom Type	Valley gradient.
Valley Bottom Subtype	Valley form and sideslope.
Stream Classification	Class as defined by Rosgen (1985) A1, B2, etc., including debris, stream size, flow regimen, depositional feature, meander pattern, sinuosity, form, bankfull gradient.

Other miscellaneous measurements include streambank canopy, overhang, streambank cover, bank slope, and undercut.

Use, Testing, Validation: Riparian portion of method is in draft.

Ease of Application: The system is easy to apply and particularly useful with aerial photographs. The system becomes more time consuming as additional field attributes are added. Its ease of application would be dependent on the approach used to interpret the data.

Use in Defining System Response and Potential: The procedure as described does not address system response other than vegetation ecology, although there are many attributes, such as stream type, that could be used in the interpretation of system response. Site potential is inherent in the data storage and analysis system. The attributes collected will allow a more complete estimate of system response.

Use in Determining State of System: The USFS procedure can be used to describe the state of a riparian system, but the inventory would have to be designed to deal with cause and effect relationships that would be useful in determining potential state changes in a riparian system.

Relation to Other Procedures: The USFS procedure does a good job of keeping open to detailed attributes, such as soils information, landforms, and attributes. Standard soil taxonomic classification can be placed into the procedure at the modifier level. The procedure appears to fit into other vegetation classification schemes, such as those done on a regional or provincial level. The ECODATA system appears to be a good data manager that would benefit the analysis of any type of wetland/riparian classification effort.

Automated Data Processing: ADP is inherent in the procedure and includes automated analysis for determining a number of characteristics including community type.

Limitations and Assumptions: The full application of all data attributes in the procedure recognizes nearly all important vegetation, hydrologic, and geomorphic characteristics. Thus it requires a diversified and experienced team to conduct the full application of the data collection described in the document. The procedure appears flexible as it does not tie the user down to any particular taxonomic system, but retains data integrity (with the exception of stream morphology). This allows the user to move into many types of classification systems easily and to provide important additional descriptions.

10. Name: Classification of Wetlands and Deepwater Habitats of the United States.

Authors: Lewis M. Cowardin, Virginia Carter, Francis Golet, and Edward LaRoe.

Reference: Cowardin L.M., V. Carter, F. Golet, and E. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States, 1979. U.S. Department of the Interior, Fish and Wildlife Service, FWS/OBS-79/31, Washington, DC. 103 pp.

Objectives: The classification is designed for use in a new inventory of wetlands and deepwater habitats and is intended to describe ecological taxa, arrange them in a system useful to resource managers, furnish units for mapping, and provide uniformity of concepts and terms. The system provides hierarchical levels from the broadest (marine, estuarine, riverine, lacustrine, palustrine) to the lowest level, dominance type, which is named for the dominant plant or animal form of the area.

Designed Users: Land managers and biologists.

Area of Applicability: United States (although system could be used anywhere).

Classification Units, Description, and Data:

Classification Units	**Description**
System	Basic water source/feature (marine, estuarine, riverine, etc.).
Subsystem	Basic water persistence attributes (subtidal, intertidal, lower perennial, upper perennial, etc.).
Class	Gross substrate/vegetation form (rock bottom, aquatic bed, emergent wetland, rocky shore, forested, etc.).
Subclass	Specific substrate/vegetation type (bedrock, sand, mud, needle-leaved evergreen, broad-leaved deciduous, etc.).
Dominance	Dominant plant/animal species (horsetail, black cottonwood, willow, caddisfly, crayfish).
Modifiers	Site specific attributes of soil, regime, water chemistry, and land alteration (salinity, pH, flooding condition, mineral or organic, farmed, diked, etc.).

Use, Testing, Validation: This system is currently in use by many agencies for the general inventory and classification of habitats. It has been used in small and large applications. Products from the classification can give the manager a good overview of the resource.

Ease of Application: The system is easy to apply and particularly useful with aerial photographs. The system becomes more complex as modifiers are added to the description, as with specific hydrology and water chemistry.

Use in Defining System Response and Potential: The USFWS procedure does not consider responsiveness or functional processes.

Use in Determining State of System: The USFWS procedure can be used to describe the state of a riparian system, but is not designed to deal with cause and effect relationships that would be useful in determining potential state changes in a riparian system.

Relation to Other Procedures: The USFWS procedure does a good job of keeping open to more detailed modifiers, such as soils information. Standard soil taxonomic classification can be placed into the procedure at the modifier level. The dominance level is fairly standard as vegetation description goes. Some differences between other procedures can be expected in the delineation between overstory, dominance density, etc. The procedure appears to fit into other vegetation classification schemes, such as those done on a regional or provincial level. Overall, the procedure recognizes the difference between fluvial surfaces and major vegetation forms at a level that makes it reasonably easy to merge with classification procedures for other considerations, such as geology, climate, landforms, etc.

Automated Data Processing: ADP was not discussed in the procedure. Since all but the lower hierarchy are defined (5 system names, 8 subsystem names, 11 class names, and 28 subclass names), most of a classification could be standardized and used in ADP very easily. When more detail is demanded from the dominance and modifier description, ADP applications will be more complex.

Limitations and Assumptions: The procedure is not designed to reflect potential natural communities or community ecology. However, a detailed classification using some of the other procedures discussed above could provide information fitting the protocol of this procedure.

11. Name: Riparian Community Type Classification of Eastern Idaho-Western Wyoming.

Authors: Andrew P. Youngblood, Wayne G. Padgett, and Alma H. Winward.

Reference: Youngblood, A.P., W.G. Padgett, and A.H. Winward. 1985. Riparian community type classification of eastern Idaho-western Wyoming. USDA Forest Service, Intermountain Region, R4-Ecol-85-01. 78 pp.

Objectives: To contribute to the broad regional classification program of the USDA Forest Service by developing a riparian community type classification for eastern Idaho and western Wyoming. To describe the general geographic, topographic, edaphic, and floristic features of each community type. To describe the successional trends for each community type, where possible. To present information on resource values and management opportunities for each community type.

Designed Users: Land managers and biologists.

Area of Applicability: Eastern Idaho, western Wyoming (although system could be used anywhere).

Classification Units, Description, and Data:

Classification Units	Description
Canopy Cover	The area covered by the generalized outline of an individual plant's foliage, or collectively covered by all individuals of a species within a stand or sample area. Canopy cover percentages are a determining factor in distinguishing community types, the basic unit of this taxonomical system as described in Daubenmire (1968).
Soils	Soils were classified to the family level using standard pedon description methods (USDA-SCS 1975). Available water capacity (inches of water/inches of soil) was estimated for the top 50 cm (20 inches) using guidelines developed by the U.S. Department of Agriculture, Soil Conservation Service (1983). A general characterization of geologic materials was determined from geologic maps.
Community Type	An aggregation of all plant communities distinguished by floristic and structural similarities in both overstory and undergrowth layers.

Use, Testing, Validation: Document serves as a test and validation. The procedure, or a similar representation, is used by a number of U.S. Forest Service offices.

Ease of Application: The field data requires a number of statistical procedures to analyze canopy data. However, the application is straightforward and should not be difficult for experienced biologists. Developing relationships among adjacent riparian community types and upland vegetation requires experience.

Use in Defining System Response and Potential: The document recognizes the utility of classification to wildlife, livestock, and fire effects and the aid such a classification provides to many areas of management. The procedure or document does not identify potential natural communities; however, reference is made to a stable community. Stable refers to the condition of little or no perceived change in plant communities that are in relative equilibrium with existing environmental conditions. Stability describes persistent, but not necessarily culminating, stages (climax) of plant community succession.

Use in Determining State of System: The description provided by the procedure included a discussion of succession and management. A general discussion of possible successional pathways are given. The physical information on soils and geology would be helpful in determining the state of the system, but more information on geomorphology would be needed for a complete discussion.

Relation to Other Procedures: This procedure relates well to other taxonomical procedures reviewed and uses standard soil taxonomy and Daubenmire community ecological principles. This document provides one of the first efforts in describing riparian community ecology and the interrelationship with soil and water. Many of the community types described in this document have been recognized elsewhere. This document should be reviewed by anyone new to riparian classification.

Automated Data Processing: ADP is inherent in carrying out the procedure.

Limitations and Assumptions: The procedure recognizes that there are stable communities and provides estimates of successional pathways. This approach would need to be continued to derive the largest benefit to management.

Literature Cited

Baad, M.F. 1988. Soil-vegetation correlations within the riparian zone of Butte Sink in the Sacramento Valley of northern California. U.S. Fish and Wildlife Service, Biological Report 88(25), National Ecology Research Center, Ft. Collins, CO. 48 pp.

Bailey, R.G. 1976. Ecoregions of the United States. U.S. Forest Service, Ogden, UT. (Map only: scale 1:7,500,000).

Baldwin, E.M. 1964. Geology of Oregon. Kendall/Hunt Publishing Company. 170 pp.

Batchelor, R., M. Erwin, R. Martinka, D. McIntosh, R. Pfister, E. Schneegas, J. Tayor, and K. Walther. 1982. A taxonomic classification system for Montana riparian vegetation types. Montana rural Area Development Committee, Bozeman, Montana. 13 pp.

Boggs, K., P. Hansen, R. Pfister, and J. Joy. 1990. Classification and management of riparian and wetland sites in northwestern Montana, draft version 1, Montana Riparian Association, School of Forestry, University of Montana. 217 pp.

Brown, D.E. 1978. Southwestern wetlands — their classification and characterization. in: Proceedings of the National Riparian Ecosystems Symposium, Callaway Gardens, Georgia, Dec. 11-13, 1978. pp. 269-282.

_____. 1973. The natural vegetative communities of Arizona (map, scale 1:500,000). State of Ariz., Arizona Resources Information System (ARIS), Phoenix.

_____. and C.H. Lowe. 1973. A proposed classification for natural and potential vegetation in the Southwest with particular reference to Arizona. Ariz. Game and Fish Dep., Fed. Aid Proj. Rpt. W-53-R-22 WP-4JI:1-26.

_____. 1974a. A digitized computer compatible classification for natural and potential vegetation in the Southwest with particular reference to Arizona. J. Ariz. Acad. Sci. (9) Supp. 2:1-11.

_____. 1974b. The Arizona system for natural and potential vegetation—illustrated summary through the fifth digit for the North American Southwest. J. Ariz. Acad. Sci., (9). Suppl. 3:31-56.

_____, C.H. Lowe, and C.P. Pase. 1977. A digitized systematic classification for the natural vegetation of North America with a hierarchical summary of world ecosystems. U.S. Fish and Wildlife Service. in: Symposium on Classification, Inventory and Analysis of Fish and Wildlife Habitat. Jan. 24-27, 1977. Phoenix, Arizona.

Brown, K.F. and R.M. Kerr. 1979. Physiographic regions map. Am. Geographic Soc., New York, NY.

Cowardin L.M., V. Carter, F. Golet, and E. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States, 1979. U.S. Department of the Interior, Fish and Wildlife Service, FWS/OBS-79/31, Washington, DC. 103 pp.

Daubenmire, R.D. 1959. A canopy-coverage method of vegetation analysis. Northwest Science 33:43-66.

_____. 1968. Plant Communities. Harper and Row, Publishers, New York, NY. 300 pp.

_____. 1970. Steppe vegetation of Washington. Technical Bulletin 62. Washington Agricultural Experiment Station, Washington State University, Pullman, WA. 131 pp.

_____. 1978. Plant geography with special reference to North America. Academic Press, New York, NY. 338 pp.

_____ and J.B. Daubenmier. 1968. Forest vegetation of eastern Washington and northern Idaho. Technical Bulletin 60. Washington Agricultural Experiment Station, Washington State University, Pullman, WA. 104 pp.

Dick-Peddie, W.A. and J.P. Hubbard. 1977. Classification of riparian vegetation. in: Symposium on the Importance, Preservation and Management of the Riparian Habitat, July 9, 1977, Tucson, Arizona.

Fenneman, N.M. 1931. Physiography of Western United States. McGraw-Hill Book Co., Inc. New York and London. 534 pp.

Franklin, J.F. and C.T. Dyrness. 1973. Natural vegetation of Oregon and Washington. Gen. Tech. Rep. PNW-8. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station; 1973. 417 pp.

Gebhardt, K., W.S. Platts, M. Hill. 1990. Instream flow considerations for maintenance of wetland/riparian systems. Unpublished presentation at the Society of Wetland Scientists spring meeting, Breckenridge, Colorado.

Hann, W.J. and M.E. Jensen. 1987. Ecosystem classification handbook. Chapter 4 - Ecodata sampling methods. Region I, USDA, Forest Service. Missoula, Montana.

Hansen, P. 1989. Inventory, classification, and management of riparian sites along the upper Missouri National Wild and Scenic River. Montana Riparian Association, School of Forestry, University of Montana, 213 pp.

______. Plant Ecologist. University of Montana, Missoula, Montana. Personal Communication.

______, S.W. Chadde, R. Pfister, 1988. Riparian dominance types of Montana. Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, Montana, Misc. Publ. No. 49. 411 pp.

______, K. Boggs, R. Pfister, and J. Joy. 1990. Classification and management of riparian and wetland sites in southwestern Montana, draft version 2a, Montana Riparian Association, School of Forestry, University of Montana. 292 pp.

______, K. Boggs, R. Pfister, and J. Joy. 1990. Classification and management of riparian and wetland sites in central and eastern Montana, draft version 2, Montana Riparian Association, School of Forestry, University of Montana. 279 pp.

Johnson, R.R., S.W. Carothers, and J.M. Simpson. 1984. A riparian classification system. in: R.E. Warner and K.M. Hendrix [eds]. California Riparian Ecosystems—Ecology, Conservation, and Productive Management. Univ. California, Berkeley. pp. 375-382.

Kovalchik, B.L. 1987. Riparian zone associations: Deschutes, Ochoco, Fremont, and Winema National Forests. USDA Forest Service Region 6 Ecology Technical Paper 279-87 Pacific Northwest Region, Portland, Oregon. 171 pp.

Kroetsch, D.J., C. Tarnocai, and A. Eagle. 1988. The Canadian wetland registry users manual (draft manuscript). Land Resource Research Center, Ottawa, Ontario. 69 pp.

Kuchler, A.W. 1964. Potential natural vegetation of the conterminous Untied States. Serial Publication No. 36. Am. Geographic Soc., New York, NY. 55 pp.

Layser. E.F. 1974. Vegetative classification: its application to forestry in the northern Rocky Mountains. J. For. 72:354-357.

National Wetlands Working Group, Canada Committee on Ecological Land Classification. 1986. Wetlands of Canada. 466 pp.

______. 1987. The Canadian wetland classification system (provisional edition). Lands Conservation Branch, Canadian Wildlife Service, Environment Canada, Ecological Land Classification Series No. 21. 18 pp.

Pfister, R.D., B.L. Kovalchik, S.F. Arno, and R.C. Presby. 1977. Forest habitat types of Montana. USDA Forest Service General Technical Report INT-34. Intermountain Forest and Range Experiment Station, Ogden, UT. 175 pp.

Platts, W., S. Jensen, F. Smith, 1988. Preliminary classification and inventory of riverine riparian habitats livestock/fishery study areas, Nevada. Progress Report I. Nevada Department of Wildlife, Elko, Nevada. 127 pp.

Rosgen, D.L. 1985. A stream classification system. in: Riparian Ecosystems and Their Management—An Interagency North American Riparian Conference. Gen. Tech. Rpt. ROM-120. Rocky Mountain Forest and Range Exp. Sta., Forest Service, U.S. Dept. Agr., Fort Collins, CO. pp. 91-95.

Rubec, C.D.A. Environment Canada. Hull, Canada. Personal Communication.

Swanson S., R. Miles, S. Leonard, and K. Genz. 1988. Classifying rangeland riparian areas: the Nevada task force approach. Journal of Soil and Water Conservation, 1988. 43:3.

Szaro, R.C. 1989. Riparian forest and scrubland community types of Arizona and New Mexico. Desert Plant 9:3-4, pp. 70-138.

Trewartha, G.T. and L.H. Horn. 1980. An Introduction to Climate. McGraw-Hill Book Company. 415 pp.

U.S. Department of Agriculture, Soil Conservation Service. 1975. Soil taxonomy—a basic system of soil classification for making and interpreting soil surveys. Ag. Handb. No. 436. Washington, DC. 754 pp.

_____. 1976. National range handbook, as amended. Washington, DC. 143 pp.

_____. 1983. National soils handbook, as amended. Washington, DC. 619 pp.

U.S. Department of Interior. 1990. National range handbook. BLM Manual Handbook H-4410-1. Bureau of Land Management, Washington, DC.

Windell, J., B. Willard, D. Cooper, S. Foster, C. Knud-Hansen, L. Rink, and G. Kiladis. 1986. An ecological characterization of Rocky Mountain montane and subalpine wetlands. National Ecology Center, Division of Wildlife and Contaminant Research, USDI, Fish and Wildlife Service, Washington, DC. Biological Report 86(11). 298 pp.

Youngblood, A.P., W.G. Padgett, and A.H. Winward. 1985. Riparian community type classification of eastern Idaho-western Wyoming. USDA Forest Service, Intermountain Region, R4-Ecol-85-01. 78 pp.

Appendix A
Riparian Classification Comparison*

Name of Classification or Description	Physiographic Features	Geologic Features	Climatic Features
1. Standard Ecological Site Description	General orientation, geomorphic landform, slope ranges, elevation ranges.	Specific formations, parent rock or material included.	Range of average and seasonal distribution of precipitation and temperature for soil and ambient air.
2. Southwest Wetlands	Inherent to some degree in biogeographic realm.	Not provided.	Inherent in climate zone.
4. Riparian Zone Associations	Provided in description.	Provided in description.	Provided in description.
5. Riparian-Wetland Sites in Montana	Geomorphic landform & orientation, elevation ranges, provided for in narrative.	Provided.	Provided.
6. Nevada Task Force Approach	Provided at ecological site description level as in (1) above.		
7. Riverine Riparian Habitats	Provided as geologic district, land type association, and land type.	Provided as geologic district, land type association.	Provided as domain and division (Trewartha and Horn 1980).
9. Ecosystem Classification Handbook	Includes geomorphic landform, valley bottom type and subtype, Horton stream order.	Parent material description.	Not provided.
10. Wetland and Deepwater Habitats	General, from Bailey 1976.	Not provided.	General, from Bailey1976.
11. Riparian Community Types	Provided.	Provided.	Provided.

* Classifications 3 and 8 are not included.

Riparian Classification Comparison (Continued)

Name of Classification or Description	Soils Features	Water Features	General Physical Features
1. Standard Ecological Site Description	Description of major properties, association of soils, SCS conventions, and soil taxonomy standards.	Stream type as defined by Rosgen. Flow regime, surface-ground-water features.	Given in site description. Similar to a site type.
2. Southwest Wetlands	Not provided.	Not provided.	Not provided.
4. Riparian Zone Associations	Provided.	Riverine systems are not specifically discussed, but water regime and fluvial process are generally covered.	Basic unit is riparian landform. Includes soils, fluvial process and water regime.
5. Riparian - Wetland Sites in Montana	Provide as standard SCS soil taxonomy.	Flow regime and subsurface features are generally covered.	Given in site description. Includes soils, fluvial processes and water regimes.
6. Nevada Task Force Approach	Provided in naming convention.	Stream type as defined by Rosgen. Moisture condition as defined by Johnson and Carothers, 1981.	Provided in naming convention.
	—Also provided at the ecological site level of classification—		
7. Riverine Riparian Habitats	Provided in land type, valley bottom units.	Described in riverine - riparian complexes and in riverine types.	Described at the riverine site level.
9. Ecosystem Classification Handbook	Uses SCS conventions.	Stream type as defined by Rosgen.	Basic physical description is called site type.
10. Wetlands and Deepwater Habitats	Provided as modifiers. Uses SCS hydric soils descriptions.	Identified at the subsystem level, substrate at the class and subclass level, water persistence at the subsystem level.	Provided as modifiers.
11. Riparian Community Types	Provided, SCS standard.	Not provided.	Provided.

Riparian Classification Comparison (Continued)

Name of Classification or Description	Ecosystem Description	Existing Vegetation			
		Class	Subclass	Dominance	Composition
1. Standard Ecological Site Description	Major land resource area (MLRA) given.	Can be derived from dominance and composition.		Provided.	Provided.
2. Southwest Wetlands	Inherent in biogeographic realm, formation type, vegetation, regional formation (biome).	Obtained from formation type and regional formation.		Series and association.	Provided.
4. Riparian Zone Associations	Provided.	Can be obtained from dominance information.		Provided.	Provided.
5. Riparian-Wetland Sites in Montana	Provided. Can be used with USFWS (10).	Provided. (called formation class and subclass).	Provided.	Provided.	Provided
6. Nevada Task Force Approach	Generally provided by land classes.	Provided.	Provided.	Provided.	Can be provided.
	—Also provided at the ecological site level of classification—				
7. Riverine Riparian Habitats	Provided.	Can be obtained from dominance information.		Provided.	Provided.
9. Ecosystem Classification Handbook	Provided.	Provided in range, ecosystem, and vegetation type.		Provided.	Provided.
10. Wetland and Deepwater Habitat	Generally provided at system level as marine, estuarine, riverine, etc.	Provided.	Provided.	Provided.	Not required.
11. Riparian Community Types	Provided.			Provided.	Provided.

Riparian Classification Comparison (Continued)

Name of Classification or Description	Functional Ecological Description	PNC	Ecological Units Ecological Site	Community Type
1. Standard Ecological Site Description	Provided in site narrative.	Provided.	Provided.	Provided in site interpretation narrative.
2. Southwest Wetlands	Inherent to some degree at all levels.	Not specifically provided.		Association.
4. Riparian Zone Associations	Provided.	Provided.	Riparian association.	Provided.
5. Riparian - Wetland Sites in Montana	Provided in site interpretation.	Provided; called habitat type, or riparian assiciation in describing what could occur on a riparian site type.		Provided in site description.
6. Nevada Task Force Approach	We assume a site description would accompany the site name.	Provided.	Provided.	Provided, called riparian community.
7. Riverine Riparian Habitats	Provided.	Provided.	Provided.	Provided.
	- Also includes riverine-riparian complexes which appear very useful in relating riparian and riverine sites -			
9. Ecosystem Classification Handbook	Provided.	Provided; called habitat type, and a more detailed habitat type phase.		Provided; includes broader unit, called vegetation type, which groups similar community types.
10. Wetland and Deepwater Habitats	Not included.	Not required Could be placed as modifiers.		
11. Riparian Community Types	Provided.	Not given. Stable community given.	Not provided.	Provided.

Riparian Classification Comparison (Continued)

Name of Classification or Description	Description of Procedures Relevance to Site Management
1. Standard Ecological Site Description	Provided in site interpretation narrative. Relates various seral stages or community types with management actions such as grazing, wild fire, recreation. Also provides water-soil interaction description and related limiting factors.
2. Southwest Wetlands	Not provided, but could be easily accommodated in a site description, provided cause and effect and site correlation information is collected.
4. Riparian Zone Associations	Provided in site interpretation narrative. Relates various plant zone associations and community types with management actions such as grazing, wildfire, and recreation. Also provides water-soil interaction, Kovalchik description, and related limiting factors.
5. Riparian-Wetland Sites in Montana	Provided in site interpretation narrative. Relates various community types with management actions such as livestock, timber, wildlife, in fisheries, fire, soil management and rehabilitation opportunities, and recreational uses and considerations.
6. Nevada Task Force Approach	The reference provides an example of how site management relates to the classification system. It is assumed that site management features would be included in a classification conducted by the procedure.
7. Riverine Riparian Habitats	Provided in site interpretation narrative. Relates various community types with management actions such as grazing, wildfire, recreation, etc. Also provides water-soil interaction description and related limiting factors.
9. Ecosystem Classification Handbook	The ECODATA procedure includes a number of analysis techniques specifically for management. It is assumed that site management features would be included in classification documentation produced as a part of the interpretation and analysis of the ECODATA data base.
10. Wetland and Deep-water Habitats	Not provided.
11. Riparian Community Types	Some information is given on application to site management. Management information is given under succession/management sections.

Appendix B
Converting Between Classification Procedures (Vegetation)

Users of riparian classification procedures may want to convert from one procedure to another or may want to structure their inventory data to fit more than one classification process. Generally, it is difficult, if not impossible, to take a classification of lesser detail and fit it into a classification of greater detail. For example, it would be impossible, without additional data, to take information from National Wetlands Inventory, which utilizes the procedure of Classification of Wetlands and Deepwater Habitats, Cowardin et al.(1979), at a very general level, and place it into a process designed for community types and/or associations (potential natural community). On the other hand, an inventory that utilizes a very detailed level of vegetation inventory (dominance of species), within Cowardin's (1979) procedure, could be used in most of the other classification processes with some adjustment.

Where a procedure of classification has developed a key, such as in Montana, parts of Oregon, and eastern Idaho, general information on the composition of vegetation sites from less detailed classifications may require only minor field checking to make use of the information.

Users will have a much easier time classifying sites utilizing an existing classification in an area where it is applicable compared to developing new classifications in areas where none exist.

When transferring management recommendations from existing classifications to new areas, it is important that site information be collected to ensure that not only the vegetation is comparable, but that the site functions are comparable as well.

The following information in Appendices C-E should help in understanding and applying classification systems to a particular area.

Appendix C
Definition Crosswalk
(Vegetation Classification Terms)

Major terms are given with the applicable reference shown in parentheses. Terms having similar definitions are indented and given below with their applicable reference shown in parentheses.

Association (4,5,6,9)	In normal usage, this is a climax community type or potential natural community. In riparian systems, because of their dynamic nature, a true climax community may not have an opportunity to occur (Youngblood et al. 1985). An association for a riparian environment is therefore a plant community type representing the latest successional stage attainable on a specific hydrologically influenced surface (Kovalchik 1987, Hansen 1989).Hansen (1989) uses the term "riparian association" while Youngblood et al. (1985) chose the term "potential stable community type" that approaches an association.
Community Type (1,4,5,6,7,9) Association (2)	All sites in which the dominant and/or indicator species are similar. The aggregation of all plant communities distinguished by floristic and structural similarities in both overstory and undergrowth layers. The method in which community types are determined varies between procedure. Generally some type of statistical procedure is applied to composition or structural data that has been collected through a stratified mapping procedure. The discreetness of the mapping unit reflects the complexity of representative community type. In procedure (7), Platts et al. (1988) has a unit called a complex which may contain several community types that appear to be associated to similar riverine sequences. Community type names are generally determined from the name of the dominant or codominant species. Also, Dick-Peddie and Hubbard (1977) stress the importance of using obligate riparian species when determining the dominant species. This convention, however, is not specifically stated in all of the riparian classification procedures.
Dominant Species (1,2,3,4,5,6,7,9,10)	Those species in a stand that have the greatest foliar canopy volume per unit area (9). Those species with at least 25 percent [30 percent in (10)] canopy coverage in the tallest layer of a site (5). Therefore, the method by which dominant species is collected should be known. Also, Dick-Peddie and Hubbard (1977) stress the importance of using obligate riparian species when determining the dominant species. This convention, however, is not specifically stated in all of the riparian classification procedures.

Ecological Site (1,6) Range Site (1) Site Type (9) Riparian Site Type (5) Riverine Site (7) Riparian Site (7)	A distinctive type of land that differs from other kinds of land in its ability to produce a characteristic potential natural community. (This definition has been modified to not limit the natural community to just plants.) For example, as used in (7), a riverine site would be similar to the above but would produce a characteristic natural stream community.
Potential Natural Community (1,9) Climax Community(1)	The biotic community that would become established if all successional sequences were completed without interferences by man under the present environmental conditions. Often, the potential natural community of a site has to be estimated, since most managed sites support seral plant communities due to ongoing disturbance. Climax plant community as defined in (9) is the culminating stage in plant succession for a given environment that develops and perpetuates itself in the absence of disturbance (see habitat type).
Habitat Type (4, 5, 9)	All the land capable of producing similar communities at climax. A habitat type name incorporates those indicator plant species which best define the environment to be classified. A habitat type may or may not be synonymous with a range site/ecological site; most often it is a somewhat broader classification than the range site.

Appendix D

Stream Classification - Wetland and Deepwater Habitats (10) Compared to Rosgen, 1985

Riverine (10, 7, 6, 5)	Habitats contained within a channel and/or wetland (assuming also riparian) habitats dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens and habitats with water containing ocean-derived salts in excess of 0.5 parts per thousand (10). [This definition generally fits well with (7).]
Tidal (10)	Low gradient with water velocity under tidal influence. Streambed is mainly mud with occasional patches of sand (10). Would be similar to a Rosgen C4, C5, C6, F4, F5.
Lower Perennial (10)	Low gradient, low velocity water, no tidal influence with water flowing throughout the year. Substrates consists mainly of sand and mud (10). Would be similar to Rosgen C4, C5, C6, F4, F5.
Upper Perennial (10)	High gradient, high velocity. The substrate consists of rock, cobbles, or gravel with occasional patches of sand (10). Similar to Rosgen A and B stream types.
Intermittent (10)	The channel contains nontidal flowing water for only part of the year. When the water is not flowing, it may remain in pools or surface water may be absent (10). (This definition would also include ephemeral streams, those that only flow in response to precipitation.)

Appendix E

Classification of Wetland and Deepwater Habitats(10) Compared to Other Procedures (at the Class and Subclass Levels)

Class, Subclass (10)	The class is the general appearance of the habitat in terms of either the dominant life form of the vegetation or the physiography and composition of the substrate. Subclasses are used for finer differentiation.
Emergent	Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (10). Named marshland in (2). Emergent/saturated/organic soil is equivalent to fen (3, 10). In (3), this includes: Atlantic ribbed fen, basin fen, channel fen, collapse scar fen, feather fen, floating fen, horizontal fen, ladder fen, lowland polygon fen, net fen, northern ribbed fen, palsa fen, shore fen, slope fen, snowpatch fen, spring fen, and stream fen. An emergent/saturated/Palustrine area in (10) would be called herbaceous in (8). Emergent/saturated, fresh water/mineral soil is equivalent to marsh, fresh water in (8), or in (3), a subclass could be tidal fresh water marsh, floodplain marsh, stream marsh, channel marsh, active delta marsh, inactive delta marsh, terminal basin marsh, shallow basin marsh, kettle marsh, seepage track marsh, and shore marsh. Emergent/saturated/mixosaline/mineral soil is equivalent to marsh, saline water in (8) or estuarine high marsh, estuarine low marsh, coastal high marsh, and coastal low marsh in (3).
Moss-Lichen	A saturated regime where mosses or lichens cover substrate other than rock and where emergents, shrubs, or trees make up less than 30 percent of the areal cover (10). Called a bog in (8). In (3) this includes: Atlantic plateau bog,basin bog, blanket bog, collapse scar bog, domed bog, flat bog, floating bog, lowland polygon bog, mound bog, northern plateau bog, palsa bog, peat mound bog, peat plateau bog, polygonal peat plateau bog, shore bog, slope bog, string bog, or veneer bog.
Aquatic Bed	Wetlands and deepwater habitats dominated by plants that grow principally on or below the surface of the water for most of the growing season (10). Called floating, rooted submerged, rooted floating, rooted emergent in (8). Called floating or submerged in (3). Called submergents in (2).

Scrub-shrub	Areas dominated by woody vegetation less than 6 meters (20 feet) tall (10). Called a Swampscrub in (2); however, height is less than 12 m (35 feet). Called shrub type in (3). Scrub-shrub/saturated/organic soil is called a carr in (8). Scrub-shrub, saturated, fresh (acidic), organic soil in (10) called a shrub bog in (8). Scrub-shrub, seasonally flooded, fresh water, mineral soil in (10) called a shrub wetland, mineral soil, fresh water in (8). Scrub-shrub, seasonally flooded, hypersaline water, mineral soil in (10), called shrub wetland mineral soil, saline water in (8).
Forested	Characterized by woody vegetation that is 6 m tall or taller (20 feet) in (10). Called swampforest or riparian forest if taller than 35 feet, (12 m) in (2), treed in (3), coniferous or deciduous angiosperm forest in (8) [which relates to the subclasses of deciduous or evergreen in (10)].
Streambed	Wetlands contained between channels and that are not considered permanently exposed to water (10). Subclasses included bedrock, rubble, cobble-gravel, sand, mud, organic, and vegetated streambeds. Called a strand in (2).
Unconsolidated Shore	All wetlands having unconsolidated substrates with less than 75 percent areal cover of stones, boulders, or bedrock; less than 30 percent areal cover of vegetation other than pioneering plants; and not considered permanently covered by water throughout the growing season [see (10) for exact water regime definitions]. Subclasses include cobble-gravel, sand, mud, organic, and vegetated. Called a strand in (2).
Rock Bottom	All wetlands having an areal cover of stones, boulders, or bedrock 75 percent or greater (25 percent or greater for unconsolidated bottom), vegetative cover less than 30 percent, and are generally covered throughout the growing season with water.

Appendix F
Processes and Associated Factors Controlling Riparian Function

Moisture/Inundation

Discharge	Climate/weather, watershed roughness/detention, slope.
Stage/Inundation/ Velocity	Discharge, channel geometry, energy dissipation (hydraulic controls, channel/flood plain roughness), hydraulic gradient.
Flood Plain Recharge	Substrate texture and configuration, stage/inundation (depth, extent, duration), vegetation.
Flood Plain Storage and Release	Substrate texture and configuration, flood plain recharge.
Saturated Surface	Recharge, substrate texture and configuration, hydraulic gradient.
Capillarity	Substrate texture and configuration, saturated surface.
Evapotranspiration Vegetation	Shading and wind, capillarity.

Physical and Chemical Water Quality

Aerobic State	Substrate texture and configuration, hydraulic gradient, vegetation density.
Salt Flux (flood plain)	Dissolved solids in saturated surface, capillarity, evapotranspiration, flood plain recharge.
Nutrient Flux	Transport/deposition, capillarity, recharge, evapotranspiration, biological processes.
Material Flux	Transport/deposition, vegetation, substrate texture, discharge.
Cation Exchange	Substrate texture and composition, vegetation.
Shading, Wind	Vegetation, geomorphology, topography.
Biologic Input/Release	Temperature, organisms, water chemistry.

Transport/Deposition

Degradation/Aggradation	Substrate, slope, stage, vegetation.
General Material	Availability of material, protection removal/transport (armoring), filtration, adsorption, stage (velocity).
Ice	Temperature, geomorphology, stage, velocity.

Geomorphology/Channel Geometry

Channel Cross-Section	Substrate texture and configuration, discharge, transport/deposition.
Sinuosity	Substrate texture and configuration, discharge, transport/deposition, hydraulic gradient.
Ice	Weather, stage/inundation/velocity, substrate.

Recruitment/Reproduction

Seed, Sprout	Transport/deposition, substrate texture, moisture/inundation.

Survival

Moisture	Moisture/inundation.
Nutrients, Water Quality	Physical/chemical water quality, transport/deposition.
Solar	Shading.
Disturbance Factors	Stage/inundation/velocity, moisture factors, aerobic state, salt flux, shading, aggradation/degradation, material transport,ice, community dynamics (competition).

Community Dynamics

Community dynamics incorporates all of the reproduction/recruitment and survival factors.

*U.S. Government Printing Office: 1991 — 573-003/22005

Transport/Deposition

Degradation/Aggradation Su'

General Material

Ice

Geomorphology/Ch

Channel Cross-Se

Sinuosity

Ice

Recr

Se

Attachment K

WETLANDS AND 401 CERTIFICATION OPPORTUNITIES AND GUIDELINES FOR STATE AND ELIGIBLE INDIAN TRIBES

United States
Environmental Protection
Agency

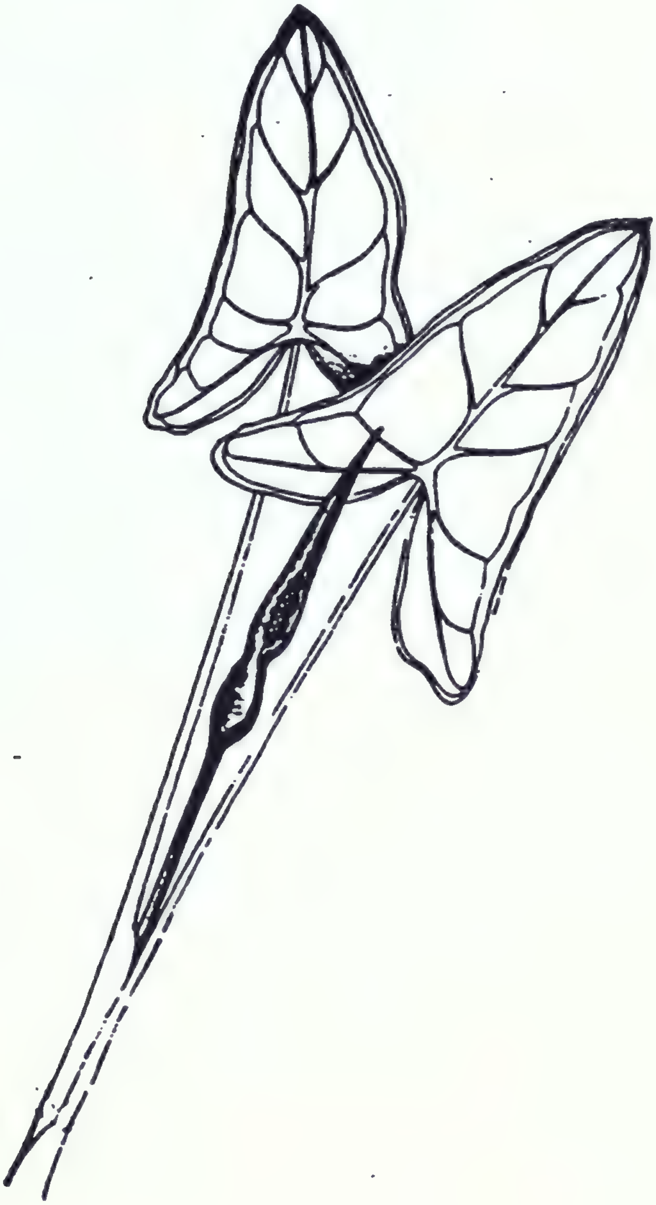
Office of Water
(A-104F)

April 1989

EPA

Wetlands And 401 Certification

Opportunities And Guidelines For States And Eligible Indian Tribes



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 28 1989

OFFICE OF
WATER

NOTE TO THE READER

I am pleased to introduce this handbook, "Wetlands and 401 Certification," developed by EPA's Office of Wetlands Protection. This document examines the Section 401 State water quality certification process and how it applies to wetlands. We strongly encourage States to use this handbook as one reference when establishing a wetlands protection program or improving wetlands protection tools.

Protection of wetland resources has become an important national priority as evidenced by President Bush's 1990 Budget statement calling for "no net loss" of wetlands. In addition, the National Wetlands Policy Forum included a recommendation in their 1988 report which says that States should "make more aggressive use of their certification authorities under Section 401 of the Clean Water Act, to protect wetlands from chemical and other types of alterations". This handbook is intended to help States do just that.

EPA would like to work with States who wish to delve into 401 certification for wetlands. You will find EPA Regional contacts listed in Appendix A of the document. The Office of Wetlands Protection plans to provide additional technical support including guidance focused on wetland-specific water quality standards.

It is very important to begin now to address the loss and degradation of this nation's wetlands. That is why 401 certification is a perfect tool, already in place, for States just getting started. It can also help States fill some gaps in their own statutory authorities protecting wetlands. States can make great strides using their existing 401 certification authorities, while developing the capability and the complementary programs to provide more comprehensive protection for wetlands in the future.

Sincerely,

David G. Davis
Director
Office of Wetlands Protection

ENDNOTES

1. The state water quality certification process is authorized by Section 401 of the Clean Water Act, 33 U.S.C. §1341.

2. A Tribe is eligible for treatment as a State if it meets the following criteria: 1) it is federally recognized; 2) it carries out substantial government duties and powers over a Federal Indian Reservation; 3) it has appropriate regulatory authority over surface waters of the reservation; and 4) it is reasonably expected to be capable of administering the relevant Clean Water Act program. EPA is currently developing regulations to implement Section 518(e) for programs including Section 401 certification which will provide further explanation of the process tribes must go through to achieve state status. In addition, the term "state" also includes the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the Trust Territory of the Pacific Islands.

3. The National Wetlands Policy Forum, chaired by Governor Kean of New Jersey, represents a very diverse group of perspectives concerned with policy issues to protect and manage the nation's wetland resources. The goal of the Forum was to develop sound, broadly supported recommendations to improve federal, state, and local wetlands policy. The Forum released its recommendations in a report, "Protecting America's Wetlands: An Action Agenda" which can be obtained from The Conservation Foundation, 1250 24th Street, NW, Washington, D.C. 20037.

4. 33 U.S.C. §4.1313 (c)(2)(A).

5. Section 301(b)(1)(c) of the Clean Water Act.

6. If the applicant is a federal agency, however, at least one federal court has ruled that the state's certification decision may be reviewed by the federal courts.

7. 33 C.F.R. §328.3 (Corps regulations); 40 C.F.R. §232.2(q) (EPA regulations).

8. For instance, except for wetlands designated as having unusual local importance, New York's freshwater wetlands law regulates only those wetlands over 12.4 acres in size.

9. Alaska Administrative Code, Title 6, Chapter 50.

10. Kentucky Environmental Protection Act, KRS 224.005(28).

11. Tennessee Water Quality Control Act, §69-3-103(29).

12. Massachusetts Clean Waters Act, Chapter 21, §26.

13. K.R.S. 224.005(28)(Kentucky enabling legislation defining waters of the state); 401 K.A.R. 5:029(1)(bb)(Kentucky water quality standards defining surface waters); Ohio Water Pollution Control Act, §6111.01(H)(enabling legislation defining waters of the state); Ohio Administrative Code, §3745-1-02(DDD) (water quality standards defining surface waters of the state).

14. Massachusetts Clean Waters Act, Chapter 21, §26 (enabling legislation defining waters of the state); 314 Code of Mass. Regs. 4.01(5)(water quality standards defining surface waters).

15. Ohio Administrative Code, 3745-32-01(N).

16. 40 C.F.R. §131.

17. A use attainability analysis (40 C.F.R. §131.10(g)) must show at least one of six factors in order to justify not meeting the minimum "fishable/swimmable" designated uses or to remove such a designated use. The analysis must show that attaining a use is not feasible because of: naturally occurring pollutant concentrations; natural flow conditions or water levels that cannot be made up by effluent discharges without violating state water conservation requirements; human caused pollution that cannot be remedied or that would cause more environmental damage if corrected; hydrologic modifications, if it is not feasible to restore the water to its original conditions or operate the modification to attain the use; natural non-water quality physical conditions precluding attainment of aquatic life protection uses; or controls more stringent than those required by §301(b) and §306 would result in substantial and widespread economic and social impact.

18. Questions and Answers on Antidegradation (EPA, 1985). this document is designated as Appendix A of Chapter 2 of EPA's Water Quality Standards Handbook.

19. The regulations implementing Section 404(b)(1) of the Clean Water Act are known as the "(b)(1) Guidelines" and are located at 40 C.F.R. §230.

20. 40 C.F.R. §230.1(d)

21. 40 C.F.R. §230.10(c).

22. Code of Maryland Regulations Title 10, §10.50.01.02(B)(2)(a).

23. Minnesota Rules, §7050.0170. The rule states in full:

> The waters of the state may, in a state of nature, have some characteristics or properties approaching or exceeding the limits specified in the water quality standards. The standards shall be construed as limiting the addition of pollutants of human activity to those of natural origin, where such be present, so that in total the specified limiting concentrations will not be exceeded in the waters by reason of such controllable additions. Where the background level of the natural origin is reasonably definable and normality is higher than the specified standards the natural level may be used as the standard for controlling the addition of pollutants of human activity which are comparable in nature and significance with those of natural origin. The natural background level may be used instead of the specified water quality standard as a maximum limit of the addition of pollutants, in those instances where the natural level is lower than the specified standard and reasonable justification exists for preserving the quality to that found in a state of nature.

24. No. 83-1352-I (Chancery Court, 7th Division, Davidson County, 1984)(unpublished opinion).

25. These criteria are at 401 K.A.R. 5:031, §2(4) and §4(1)(c), respectively.

26. Ohio Admin. Code, §3745-32-05.

27. Ohio Admin. Code, §3745-1-05(C).

28. Copies of Ohio's review guidelines are available from Ohio EPA, 401 Coordinator, Division of Water Quality Monitoring and Assessment, P.O. Box 1049, Columbus, Ohio 43266-0149.

29. 40 CFR §131.12.

30. 48 Fed. Reg. 51,400, 51,403 (1983)(preamble).

31. Kentucky Water Quality Standards, Title 401 K.A.R. 5:031, §7.

32. Minnesota Rules, §7050.0180, Subpart 7.

33. 314 Code of Massachusetts Regulation, §4.04(4).

34. Minnesota Rules, §7050.0180, Subpart 9.

35. H.R. Rep. No. 91-127, 91st Cong., 1st Sess. 6 (1969).

36. 115 Cong. Rec. H9030 (April 15, 1969)(House debate); 115 Cong. Rec. S28958-59 (Oct. 7, 1969)(Senate debate).

37. C.F.R. §323.2(d). However, in Reid v. Marsh, a case predating these regulations, the U.S. District Court for the Northern Corps District of Ohio ruled that "even minimal discharges of dredged material are not exempt from Section 404 review". In this district, the Corps treats all dredging projects under Section 404.

38. West Virginia Code, §47-5A-1 (emphasis added).

39. Clean Water Act, §401(a)(2).

40. 40 C.F.R. §230.10(a).

41. 40 C.F.R. §230.10(d).

42. Arnold Irrigation District v. Department of Environmental Quality, 717 Pac.Rptr.2d 1274 (Or.App. 1986).

43. Marmac Corporation v. Department of Natural Resources of the State of West Virginia, C.A. No. CA-81-1792 (Cir. Ct., Kanawha County 1982).

44. 33 U.S.C. §1313(c)(2)(A).

45. West Va. Admin. Code, §47-5A-9.3 (a).

46. Unpublished paper by Dr. Paul Hill of West Virginia's Department of Natural Resources. Prepared for EPA-sponsored December 1987 workshop on "The Role of Section 401 Certification in Wetlands Protection".

47. 33 C.F.R. §325.2(b)(ii).

48. 18 C.F.R. §4.38(e)(2).

49. 40 C.F.R. §124.53(c)(3).

50. Wisconsin Administrative Code, NR 299.04.

51. West Va. Admin. Code, §47-5A-4.3.

52. Id.

53. 40 C.F.R. §121.2. EPA's regulations implementing Section 401 were issued under the 1970 Water Pollution Control Act, (not the later Clean Water Act) and thus, may have some anomalies as a result.

54. This is a reference to Section 10 of the Rivers and Harbors Act.

55. Ohio Admin. Code, §3745-32-05.

56. See, e.g., P. Adamus, Wetland Evaluation Technique (WET), Volume II: Methodology Y-87(U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS, 1987); L. Cowardin, Classification of Wetlands and Deepwater Habitats of the United States (U.S. Fish and Wildlife Service 1979). See also Lonard and Clairain, Identification of Wetland Functions and Values, in Proceedings: National Wetlands Assessment Symposium (Chester, VT: Association of State Wetland Managers, 1986)(list of twenty five methodologies).

57. See, e.g., R. Tiner, Wetlands of the United States: Current Status and Recent Trends (U.S. Govt. Printing Office 1984)(National Wetlands Inventory). The National Wetlands Inventory has mapped approximately 45 percent of the lower forty eight states and 12 percent of Alaska. A number of regional and state reports may be obtained from the National Wetlands Inventory of the U.S. Fish and Wildlife Service in Newton Corner, MA. Region 5 maps can also be ordered from the U.S. Geological Survey's National Cartographic Information Center in Reston, VA.

58. The new joint Federal Manual for Identifying and Delineating Jurisdictional Wetlands, can be obtained from the U.S. Government Printing Office 1989).

59. See, e.g., Chesapeake Bay Critical Areas Commission, Guidance Paper No. 3, Guidelines for Protecting Non-Tidal Wetlands in the Critical Area (Maryland Department of Natural Resources, April 1987).

60. For information on the Wetlands Values Data Base contact: Data Base Administrator, U.S. Fish and Wildlife Service, National Energy Center, 2627 Redwing Road, Creekside One, Fort Collins, Colorado, 80526. Phone: (303) 226-9411.

61. For example, Florida's Section 380 process designates "Areas of Critical State Concern" which often include wetlands. Florida Statutes §380.05.

62. 40 C.F.R. §230.80 (1987).

63. 16 U.S.C. §1452(3) (1980). See also, U.S.Army Corps of Engineers, Regulatory Guidance Letter No. 10 (1986).

64. See D. Burke, Technical and Programmatic Support for 401 Certification in Maryland, (Maryland Department of Natural Resources, Water Resources Administration, December 1987)(unpublished); A. Lam, Geographic Information Systems for River Corridor and Wetland Management in River Corridor Handbook (N.Y.Department of Environmental Conservation)(J. Kusler and E. Meyers eds., 1988).

The system described by Burke is called MIPS (Map and Image Processing System) and is capable of translating a myriad of information to the scale specified by the user.

65. See, e.g., [multiple authors], "Ecological Considerations in Wetlands Treatment of Municipal Wastewaters," (Van Nostrand Reinhold Co., New York, 1985); E. Stockdale, "The Use of Wetlands for Stormwater Management and Nonpoint Pollution Control: A Review of the Literature," (Dept. of Ecology, State of Washington 1986); "Viability of Freshwater Wetlands for Urban Surface Water Management and Nonpoint Pollution: An Annotated Bibliography," prepared by The Resource Planning Section of King County, Washington Department of Planning and Community Development (July, 1986).

66. The Warren S. Henderson Wetlands Protection Act of 1984, Fla. Stat. §403.91 - 403.938, required the Florida Department of Environmental Regulation to establish specific criteria for wetlands that receive and treat domestic wastewater treated to secondary standards. The rule is at Fla. Admin. Code, §17-6.

67. Maximization of sheet flow.

68. Hydrologic loading and retention rates.

69. Id.; See also L. Schwartz, Criteria for Wastewater Discharge to Florida Wetlands, (Florida Department of Environmental Regulation)(Dec. 1987)(unpublished report).

70. Copies of the draft, "Use of Advance Identification Authorities under Section 404 of the Clean Water Act: Guidance for Regional Offices", can be obtained from the Regulatory Actitivities Division of the Office of Wetlands Protection (A-104F), EPA, 401 M Street, SW, Washington, D.C. 20460.

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I. INTRODUCTION

This handbook has been developed by EPA's Office of Wetlands Protection (OWP) to highlight the potential of the State water quality certification process for protecting wetlands, and to provide information and guidance to the States.[1] Throughout this document, the term "State" includes those Indian Tribes which qualify for treatment as States under the federal Clean Water Act (CWA) Section 518(e).[2] We encourage Tribes who are interested in expanding their protection of wetlands and other waters under this new provision of the CWA to examine water quality certification as a readily available tool to begin their programs.

One of OWP's key mandates is to broaden EPA's wetlands protection efforts in areas which complement our authority under the Clean Water Act Section 404 regulatory program. Thus, we are exploring and working with other laws, regulations, and nonregulatory approaches to enhance their implementation to protect wetlands. In addition, the National Wetlands Policy Forum has recommended in its report issued in November 1988, that States "make more aggressive use of their certification authorities under Section 401 of the CWA, to protect their wetlands from chemical and other types of alterations."[3]

In light of these directives, we have examined the role of the Section 401 State water quality certification process and are working with States to improve its application to wetlands. This process offers the opportunity to fulfill many goals for wetland protection because:

- **It is a cooperative federal/State program and it increases the role of States in decisions regarding the protection of natural resources;**
- **It gives States extremely broad authority to review proposed activities in and/or affecting State waters (including wetlands) and, in effect, to deny or place conditions on federal permits or licenses that authorize such activities;**
- **It is an existing program which can be vastly improved to protect wetlands without major legislative initiatives;**
- **Its proper implementation for wetlands should integrate many State programs related to wetlands, water quality, and aquatic resource preservation and enhancement, to ensure consistency of activities with these State requirements. Examples of such programs include coastal zone management, floodplain management, and nonpoint source programs.**

The issues discussed in this handbook were identified through discussions with State 401 certification program personnel and through a workshop held in December 1987 with many of the States who actively apply 401 certification to wetlands. The handbook includes examples of how some States have successfully approached the issues discussed. Because the water quality certification process is continually evolving, we do not attempt to address all the issues here. This handbook is a first step towards clarifying how 401 certification applies to wetlands, and helping States use this tool more effectively.

EPA would like to work with the States to ensure that their authority under Section 401 is exercised in a manner that achieves the goals of the Clean Water Act and reflects the State role at the forefront in administering water quality programs. Clearly, the integrity of waters of the U.S. cannot be protected by an exclusive focus on wastewater effluents in open waters. While the federal Section 404 program addresses many discharges into wetlands, and other federal agencies have environmental review programs which benefit wetlands, these do not substitute for a State's responsibilities under Section 401. A State's authority under Section 401 includes consideration of a broad range of chemical, physical, and biological impacts. The State's responsibility includes acting upon the recognition that wetlands are critical components of healthy, functioning aquatic systems.

To help States implement the guidance provided in this handbook and to foster communication on 401 issues, you will find a list of State 401 certification contacts and federal EPA contacts in Appendix A. In order to keep this and other wetland contact lists current, EPA has asked the Council of State Governments to establish a computerized database of State wetland programs and contacts (See Appendix A for details.) EPA is also refining a list of Tribal contacts to foster communication with interested Tribes.

SUMMARY OF ACTIONS NEEDED

The following is a summary of the activities needed to make 401 certification a more effective tool to protect wetlands. States can undertake many of these activities right away, while also taking other actions which lay the groundwork for improving future 401 certification decisions. Tribes, who primarily are just beginning to develop wetlands programs, should consider these actions (along with developing water quality standards) as first steps to becoming more involved in wetlands regulatory efforts. The actions below are discussed throughout the handbook.

- All states should begin by including wetlands in their definitions of state waters.
- States should develop or modify their existing 401 certification and water quality standard regulations and guidelines to accomodate special wetland considerations.
- States should make more effective use of their existing narrative water quality standards (including the antidegradation policy) to protect the integrity of wetlands.
- States should initiate or improve upon existing inventories of their wetland resources.
- States should designate uses for these wetlands based on wetland functions associated with each wetland type. Such estimated uses could be verified when needed for individual applications with an assessment tool such as the Wetlands Evaluation Technique, or Habitat Evaluation Procedure, or region-specific evaluation methods.
- States should tap into the potential of the outstanding resource waters designation of the antidegradation policy for their wetlands.
- States should incorporate 401 certification for wetlands into their water quality management planning process. This process can integrate wetland resource information with different water management programs affecting wetlands (including coastal zone management, nonpoint source and wastewater programs).

II. WHAT IS WATER QUALITY CERTIFICATION AND HOW DOES IT WORK?

States may grant or deny "certification" for a federally permitted or licensed activity that may result in a discharge to the waters of the United States, if it is the State where the discharge will originate. The decision to grant or deny certification is based on a State's determination from data submitted by an applicant (and any other information available to the State) whether the proposed activity will comply with the requirements of certain sections of the Clean Water Act enumerated in Section 401(a)(1). These requirements address effluent limitations for conventional and nonconventional pollutants, water quality standards, new source performance standards, and toxic pollutants (Sections 301, 302, 303, 306 and 307). Also included are requirements of State law or regulation more stringent than those sections or their federal implementing regulations.

States adopt surface water quality standards pursuant to Section 303 of the Clean Water Act and have broad authority to base those standards on the waters' use and value for "public water supplies, propagation of fish and wildlife, recreational purposes, and . . . other purposes."[4] All permits must include effluent limitations at least as stringent as needed to maintain established beneficial uses and to attain the quality of water designated by States for their waters.[5] Thus, the States' water quality standards are a critical concern of the 401 certification process.

If a State grants water quality certification to an applicant for a federal license or permit, it is in effect saying that the proposed activity will comply with State water quality standards (and the other CWA and State law provisions enumerated above). The State may thus deny certification because the applicant has not demonstrated that the project will comply with those requirements. Or it may place whatever limitations or conditions on the certification it determines are necessary to assure compliance with those provisions, and with any other "appropriate" requirements of State law.

If a State denies certification, the federal permitting or licensing agency is prohibited from issuing a permit or license. While the procedure varies from State to State, a State's decision to grant or deny certification is ordinarily subject to an administrative appeal, with review in the State courts designated for appeals of agency decisions. Court review is typically limited to the question of whether the State agency's decision is supported by the record and is not arbitrary or capricious. The courts generally presume regularity in agency procedures and defer to agency expertise in their review.[6]

States may also waive water quality certification, either affirmatively or involuntarily. Under Section 401(a)(1), if the State fails to act on a certification request "within a reasonable time (which shall not exceed one year)" after the receipt of an application, it forfeits its authority to grant conditionally or to deny certification.

The most important regulatory tools for the implementation of 401 certification are the States' water quality standards regulations and their 401 certification implementing regulations and guidelines. While all of the States have some form of water quality standards, not all States have standards which can be easily applied to wetlands. Most Tribes do not yet have water quality standards, and developing them would be a first step prior to having the authority to conduct water quality certification. Also, many States have not adopted regulations implementing their authority to grant, deny and condition water quality certification. The remainder of this handbook discusses specific approaches, and elements of water quality standards and 401 certification regulations that OWP views as effective to implement the States' water quality certification authority, both generally, and specifically with regard to wetlands.

III. 401 CERTIFICATION CAN BE A POWERFUL TOOL TO PROTECT WETLANDS

In States without a wetlands regulatory program, the water quality certification process may be the only way in which a State can exert any direct control over projects in or affecting wetlands. It is thus critical for these States to develop a program that fully includes wetlands in their water quality certification process.

But even in States which have their own wetlands regulatory programs, the water quality certification process can be an extremely valuable tool to protect wetlands. First, most State wetland regulatory laws are more limited in the wetlands that are subject to regulation than is the Clean Water Act. The Clean Water Act covers all interstate wetlands; wetlands adjacent to other regulated waters; and all other wetlands, the use, degradation or destruction of which could affect interstate or foreign commerce.[7] This definition is extremely broad and one would be hard pressed to find a wetland for which it could be shown that its use or destruction clearly would not affect interstate commerce. Federal jurisdiction extends beyond that of States which regulate only coastal and/or shoreline wetlands, for instance. And in States that regulate inland wetlands, often size limitations prevent States from regulating wetlands that are subject to federal jurisdiction.[8]

Even if State jurisdiction is as encompassing or more so than federal jurisdiction, however, water quality certification may still be a valuable and essential wetlands protection device. In the State of Massachusetts, for instance, a 401 certification is not simply "rubber stamped" on the permitting decisions made pursuant to the Massachusetts Wetlands Protection Act. The State has denied certification to proposed projects requiring a federal permit even though the State wetlands permitting authority (in Massachusetts, permits are granted by local "conservation commissions") has granted authorization for a project.

There may be a number of reasons that a proposed activity may receive authorization under a State wetland regulatory program, but fail to pass muster under a 401 certification review. The most commonly cited reason, however, is that water quality personnel have a specialized understanding of the requirements and implementation of the State's water quality standards and the ways in which certain activities may interfere with their attainment.

It is important, however, to keep in mind the limitations of 401 certification when considering a comprehensive approach to protecting your wetland resources. The primary limitation is that if 401 certification is the only tool a State has to protect wetlands, it cannot place limits on activities which do not require a federal license or permit. Some activities such as drainage or groundwater pumping, can have severe impacts on the viability of wetlands, but may not require a permit or license. Ideally, 401 certification should be combined with other programs in the State offering wetlands protection opportunities (such as coastal management and floodplain management). For example, Alaska has integrated its 401 certification and coastal management consistency review processes so that the provisions of each program augment the other to provide more comprehensive protection. This approach not only strengthens protection, it reduces duplication of State efforts and coordinates permit review for applicants.[9]

IV. THE ROLE OF WATER QUALITY STANDARDS IN THE CERTIFICATION PROCESS

A. Wetlands Should be Specifically Designated as Surface Waters of the States

In order to bring wetlands fully into the State water quality certification process, a first step is to include the term "wetlands" in the State water quality standards' definition of surface waters. EPA will be working with all States through the triennial review process of State standards to ensure that their definitions are at least as comprehensive as the federal definitions for waters (see Appendix B for federal definitions of "Waters of the U.S." and the term "wetlands").

It may seem minor, but from every standpoint, it is important to have wetlands specifically designated as surface waters in State water quality standards. First, it precludes any arguments that somehow wetlands are not covered by water quality standards. Second, it predisposes decision makers (from 401 certification program managers, to the head of the agency or a water quality board, all the way to the judges on the courts that may review these decisions) to consider the importance of wetlands as part of the aquatic ecosystem. Third, it makes it clear that wetlands are to be treated as waters in and of themselves for purposes of compliance with water quality standards and not just as they relate to other surface waters.

The third point is critical and bears further explanation. When States include wetlands in the definition of surface waters covered by their water quality standards, they clarify that activities in or affecting wetlands are subject to the same analysis in the certification decision as are projects affecting lakes, rivers, or streams. This is not to say that a wetland project's effects on adjacent or downstream waters are not also part of the water quality certification analysis. Rather, it is to say that wetlands, either adjacent to or isolated from other waters, are waterbodies in and of themselves and an applicant for water quality certification must show that a proposed project will not violate water quality standards in those wetlands, as well as in other waters.

The States currently have a variety of definitions of "waters of the State" in the legislation that enables water quality standards (e.g., multi-media environmental protection acts, water quality acts, and the like). Only three States currently have the term "wetlands" explicitly listed as one of the types of waters in this enabling legislation (Nebraska, Rhode Island, West Virginia). These States need only to repeat that definition in their water quality standards and their 401 certification implementing regulations.

While most States do not have the term "wetlands" in their enabling legislation, many use the term "marshes" in a list of different types of waters to illustrate "waters of the State" in their enabling legislation. Kentucky, for example, defines waters of the State as:

> *. . . any and all rivers, streams, creeks, lakes, ponds, impounding reservoirs, springs, wells, marshes, and all other bodies of surface or underground water, natural or artificial, situated wholly or partly within or bordering upon the Commonwealth or within its jurisdiction.*[10]

When used in this way, the term "marshes" is typically understood to be generic in nature rather than being descriptive of a type of wetland, and can therefore be considered as the equivalent of the term "wetlands". In these States, however, in order to ensure that the term "marshes" is interpreted as the equivalent of wetlands, the best approach is to include the term "wetlands" in the definition of surface waters used in the State's water quality standards and in the 401 certification implementing regulations.

There is another group of States that has neither the term "wetlands" or "marshes" in the enabling legislation's definition of waters of the State. These definitions typically contain language that describes in some generic manner, however, all waters that exist in the State. They may not specifically designate any particular type of water body, as, for instance, Tennessee's Water Quality Control Act:

> *. . . any and all water, public or private, on or beneath the surface of the ground, which [is] contained within, flow[s] through, or border[s] upon Tennessee or any portion thereof . . . .*[11]

Or they may specify some types of surface waters and then generically include all others with a clause such as "and all other water bodies" or "without limitation", as does Massachusetts:

> *All waters within the jurisdiction of the Commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, and coastal waters and groundwaters.*[12]

In these States, as in the States with "marshes" in the enabling legislation's definition of waters, regulators should clarify that wetlands are part of the surface waters of the State subject to the States' water quality standards by including that term, and any others they deem appropriate, in a definition of surface waters in their water quality standards and in their 401 certification implementing regulations.

Both Kentucky and Ohio, for instance, which have the term "marshes," but not the term "wetlands" in their enabling legislation, have included the term "wetlands" in their surface water quality standards' definition of waters.[13] Massachusetts, which does not have the term "wetlands" or "marshes" in its enabling legislation, has put the term "wetlands" into its water quality standards also.[14] Additionally, Ohio's 401 certification implementing regulations include the term "wetlands" in the definition of waters covered by those regulations and specifically address activities affecting the integrity of wetlands.[15]

B. General Requirements of EPA's Water Quality Standards Regulations.[16]

When the States review their water quality standards for applicability to projects affecting wetlands, it is important to have in mind the basic concepts and requirements of water quality standards generally. Congress has given the States broad authority to adopt water quality standards, directing only that the States designate water uses that protect the public health and welfare and that take into account use of State waters for drinking water, the propagation of fish and wildlife, recreation, and agricultural, industrial and other purposes.

EPA's water quality standards regulations require States to adopt water quality standards which have three basic components: use designations, criteria to protect those uses, and an antidegradation policy.

EPA directs that, where attainable, designated uses must include, at a minimum, uses necessary to protect the goals of the CWA for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the waters. This baseline is commonly referred to as the "fishable/swimmable" designation. If the State does not designate these minimum uses, or wishes to remove such a designated use, it must justify it through a use attainability analysis based on at least one of six factors.[17] In no event, however, may a beneficial existing use (any use which is actually attained in the water body on or after November 28, 1975) be removed from a water body or segment.

Criteria, either pollutant-specific numerical criteria or narrative criteria, must protect the designated and existing uses. Many of the existing numeric criteria are not specifically adapted to the characteristics of wetlands (see last section of handbook for steps in this direction). However, almost all States have some form of the narrative standards (commonly known as the "free froms") which say that all waters shall be free from substances that: settle to form objectionable deposits; float as debris, scum, oil or other matter to form nuisances; produce objectionable color, odor, taste, or turbidity; injure, or are toxic,or produce adverse physiological responses in humans, animals, or plants; or produce undesirable or nuisance aquatic life. States have also used other narrative criteria to protect wetland quality. The use of criteria to protect wetlands is discussed in the following section.

In addition, EPA also requires that all States adopt an antidegradation policy. Several States have used their antidegradation policy effectively to protect the quality of their wetland resources. At a minimum, a State's antidegradation policy must be consistent with the following provisions:

(1) **Existing uses and the level of water quality necessary to protect existing uses in all segments of a water body must be maintained;**

(2) **if the quality of the water is higher than that necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water, that quality shall be maintained and protected, unless the State finds that lowering the water quality is justified by overriding economic or social needs determined after full public involvement. In no event, however, may water quality fall below that necessary to protect the existing beneficial uses;**

(3) **if the waters have been designated as outstanding resource waters (ORWs) no degradation (except temporary) of water quality is allowed.**

In the case of wetland fills, however, EPA allows a slightly different interpretation of the antidegradation policy.[18] Because on the federal level, the Congress has anticipated the issuance of at least some permits by virtue of Section 404, it is EPA's policy that, except in the case of ORWs, the "existing use" requirements of the antidegradation policy are met if the wetland fill does not cause or contribute to "significant degradation" of the aquatic environment as defined by Section 230.10(c) of the Section 404(b)(1) Guidelines.[19]

These Guidelines lay a substantial foundation for protecting wetlands and other special aquatic sites from degradation or destruction. The purpose section of the Guidelines states that:

". . . from a national perspective, the degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these Guidelines. The guiding principal should be that degradation or destruction of special sites may represent an irreversible loss of valuable aquatic resources."[20]

The Guidelines also state that the following effects contribute to significant degradation, either individually or collectively:

". . . significant adverse effects on (1) human health or welfare, including effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites (e.g., wetlands); (2) on the life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration or spread of pollutants or their byproducts beyond the site through biological, physical, or chemical process; (3) on ecosystem diversity, productivity and stability, including loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water or reduce wave energy; or (4) on recreational, aesthetic, and economic values."[21]

The Guidelines may be used by the States to determine "significant degradation" for wetland fills. Of course, the States are free to adopt stricter requirements for wetland fills in their own antidegradation policies, just as they may adopt more stringent requirements than federal law requires for their water quality standards in general.

C. Applying Water Quality Standards Regulations to Wetlands - What States are Doing Now

Some States have taken the lead in using 401 certification as a wetlands protection tool to protect them for their water quality and other irreplaceable functions, such as storage places for flood waters, erosion control, foodchain support and habitat for a wide variety of plants and animals. These States have taken several different approaches to wetlands protection in their water quality certification process.

1. Using Narrative Criteria

States have applied a variety of narrative criteria to projects in or affecting wetlands in the 401 certification determination. For example, Maryland's water quality standards contain a narrative directive, which the agency relied upon to deny certification for a non-tidal wetland fill. The standard provides that "[a]ll waters of this State shall be protected for the basic uses of water contact recreation, fish, other aquatic life, wildlife, and water supply."[22] In its denial, Maryland stated:

> *Storm waters are relieved of much of their sediment loads via overbanking into the adjacent wetland and a resultant decrease in nutrient and sediment loading to downstream receiving waters is occurring. To permit the fill of this area would eliminate these benefits and in the future, would leave the waterway susceptible to adverse increased volumes of storm waters and their associated pollutants. It is our determination that [a specified waterway] . . . requires protection of these wetland areas to assure that the waters of this State are protected for the basic uses of fish, other aquatic life, wildlife and water supply.*

Because wetlands vary tremendously in background levels of certain parameters measured by the traditional numerical/chemical criteria applied to surface waters, some States have relied on "natural water quality" criteria to protect wetlands in the 401 certification process. Minnesota, for instance, has taken this approach in denying certification for a flood control project because of the State's "primary concern . . . that the project would likely change Little Diann Lake from an acid bog to a fresh-circumneutral water chemistry type of wetland." The agency was concerned that "introduction of lake water into the closed acid system of Little Diann Lake would completely destroy the character of this natural resource." It relied on a provision of its water quality standards allowing the State to limit the addition of pollutants according to background levels instead of to the levels specified by criteria for that class of waters generally. The denial letter pointed out that this rule "States that the natural background level may be used instead of the specified water quality standards, where reasonable justification exists for preserving the quality found in the State of nature." According to the denial letter, because of the clear potential for impacts to the bog, the State was invoking that particular provision.[23]

Tennessee has relied on broad prohibitory language in its water quality standards to deny water quality certification for wetland fill projects and has been upheld in court. Hollis v. Tennessee Water Quality Control Board[24] was brought by a 401 certification applicant who proposed to place fill along the southeastern shoreline of a natural swamp lake. The court upheld the denial of 401 certification, explaining:

> *Reelfoot Lake is classified for fish and aquatic life, recreation, and livestock watering and wildlife uses. The [Water Quality] Board has established various standards for the waters in each classification. Among other things, these standards pertain to dissolved oxygen, pH, temperature, toxic substances, and other pollutants. The Permit Hearing Panel found the petitioner's activity will violate the "other pollutants" standard in each classification. Collectively, these ["other pollutants"] standards provide that other pollutants shall not be added to the water that will be detrimental to fish or aquatic life, to recreation, and to livestock watering and wildlife.*

The court found that while there was no evidence that the project in and of itself would "kill" Reelfoot Lake, there was evidence that the shoreline was important to recreation because tourists visit Reelfoot to view its natural beauty and the lacustrine wetlands function as a spawning ground for fish and produce food for both fish and wildlife. It found that although the evidence in the record did not quantify the damage to fish and aquatic life, recreation, and wildlife that would result from the proposed fill, the opinion of the State's expert that the activity would be detrimental to these uses was sufficient to uphold the denial of certification.

Kentucky has also relied on narrative criteria. It denied an application to place spoil from underground mine construction in a wetland area because wetlands are protected from pollution as "Waters of the Commonwealth" and because placing spoil or any fill material (pollutants under KRS 224:005(28)) in a wetland specifically violated at least two water quality criteria. One of Kentucky's criteria, applicable to all surface waters, provides that the waters "*shall not be aesthetically or otherwise degraded by substances that . . . [i]njure, [are] toxic to or produce adverse physiological or behavioral responses in humans, animals, fish and other aquatic life.*"

The other criterion, applicable to warm water aquatic habitat, provides that "*[f]low shall not be altered to a degree which will adversely affect the aquatic community.*"[25] This second criterion which addresses hydrological changes is a particularly important but often overlooked component to include in water quality standards to help maintain wetland quality. Changes in flow can severely alter the plant and animal species composition of a wetland, and destroy the entire wetland system if the change is great enough.

Ohio has adopted 401 certification regulations applicable to wetlands (and other waters) that, together with internal review guidelines, result in an approach to the 401 certification decision similar to that of the 404(b)(1) Guidelines. Its 401 certification regulations first direct that no certification may be issued unless the applicant has demonstrated that activities permitted by Section 404 or by Section 10 of the Rivers and Harbors Act (RHA) will not:

> *(1) prevent or interfere with the attainment or maintenance of applicable water quality standards;*
>
> *(2) result in a violation of Sections 301, 302, 303, 306 or 307 of the CWA; additionally, the agency may deny a request notwithstanding the applicant's demonstration of the above if it concludes that the activity "will result in adverse long or short term impacts on water quality."*[26]

Ohio has placed all of its wetlands as a class in the category of "State resource waters." For these waters, Ohio has proposed amendments to its standards to say that "[p]resent ambient water quality and uses shall be maintained and protected without exception." [27] The proposed standards also require that point source discharges to State resource waters be regulated according to Ohio's biological criteria for aquatic life.

However, Ohio has not yet developed biological indices specifically for wetlands. Thus, for projects affecting wetlands, it bases its certification decisions on internal review guidelines that are similar to the federal Section 404(b)(1) Guidelines. Ohio's guidelines are structured by type of activity. For instance, for fills, their requirements are as follows:

> *(a) if the project is not water dependent, certification is denied;*
>
> *(b) if the project is water dependent, certification is denied if there is a viable alternative (e.g., available upland nearby is viable alternative);*
>
> *(c) if no viable alternatives exist and impacts to wetland cannot be made acceptable through conditions on certification (e.g., fish movement criteria, creation of floodways to bypass oxbows, flow through criteria), certification is denied.*

Ohio's internal review guidelines also call for (1) an historical overview and ecological evaluation of the site (including biota inventory and existing bioaccumulation studies); (2) a sediment physical characterization (to predict contaminant levels) and (3) a sediment analysis.[28]

Using these guidelines, Ohio frequently conditions or denies certification for projects that eliminate wetland uses. For instance, Ohio has issued a proposed denial of an application to fill a three acre wetland area adjacent to Lake Erie for a recreational and picnic area for a lakefront marina based on its classification of wetlands as "State resource waters:"

> *Wetlands serve a vital ecological function including food chain production, provision of spawning, nursery and resting habitats for various aquatic species, natural filtration of surface water runoff, ground water recharge, and erosion and flood abatement. The O.A.C. Section 3745-1-05(C) includes wetlands [in the] State Resource Waters category and allows no further water quality degradation which would interfere with or become injurious to the existing uses. The addition of fill material to the wetland would cause severe adverse effects to the wetland. This fill would eliminate valuable wetland habitat, thereby degrading the existing use.*

The justification for this denial, according to Ohio program managers, was not only that the project would interfere with existing uses, but in addition, the project was not water dependent as called for in Ohio's internal guidelines. Ohio 401 certification program personnel note that these review guidelines present the general approach to certification, but with regard to projects that are determined to be of public necessity, this approach may give way to other public interest concerns. For example, a highway is not water dependent per se; if, however, safety and financial considerations point to a certain route that necessitates filling wetlands, the agency may allow it. In that event, however, mitigation by wetland creation and/or restoration would be sought by the agency as a condition of certification.

2. Highest Tier of Protection: Wetlands as Outstanding Resource Waters

One extremely promising approach taken by some of the States has been to designate wetlands as outstanding resource waters (ORW), in which water quality must be maintained and protected according to EPA's regulations on antidegradation (i.e., no degradation for any purposes is allowed, except for short term changes which have no long term consequences).[29] This approach provides wetlands with significant protection if the States' antidegradation policies are at least as protective as that of EPA. EPA designed this classification not only for the highest quality waters, but also for water bodies which are "important, unique, or sensitive ecologically, but whose water quality as measured by the traditional parameters (dissolved oxygen, pH, etc.) may not be particularly high or whose character cannot be adequately described by these parameters."[30] This description is particularly apt for many wetland systems.

The designation of wetlands as outstanding resource waters has occurred in different ways in different States. Minnesota, for instance, has designated some of its rare, calcareous fens as ORWs and intends to deny fills in these fens.

Ohio has issued for comment, proposed revised water quality standards that include a newly created "outstanding State resource waters" category. Ohio intends to prohibit all point source discharges to these waters. Of fourteen specific water bodies proposed to be included in this category by the Ohio EPA at this time, ten are wetlands: four fens; three bogs; and three marshes.

Because the designation of wetlands as ORWs is such an appropriate classification for many wetland systems, it would behoove the States to adopt regulations which maximize the ability of State agencies and citizens to have wetlands and other waters placed in this category. The State of Kentucky has set out procedures for the designation of these waters in its water quality standards. Certain categories of waters automatically included as ORWs are: waters designated under the Kentucky Wild Rivers Act or the Federal Wild and Scenic Rivers Act; waters within a formally dedicated nature preserve or published in the registry of natural areas and concurred upon by the cabinet; and waters that support federally recognized endangered or threatened species. In addition, Kentucky's water quality standards include a provision allowing anyone to propose waters for the ORW classification.[31]

Minnesota has a section in its water quality standards that could be called an "emergency" provision for the designation of outstanding resource waters. Normally it is necessary under Minnesota's water quality standards for the agency to provide an opportunity for a hearing before identifying and establishing outstanding resource waters and before prohibiting or restricting any discharges to those waters. The "emergency" provision allows the agency to prohibit new or expanded discharges for unlisted waters *"to the extent . . . necessary to preserve the existing high quality, or to preserve the wilderness, scientific, recreational, or other special characteristics that make the water an outstanding resource value water."*[32] This provision allows the agency to protect the waterbody while completing the listing process which could take several years.

Moreover, some States have improved on the formulation of the ORW classification by spelling out the protection provided by that designation more specifically than do EPA's regulations. For instance, Massachusetts' water quality standards state that for "National Resource Waters:"

> *Waters so designated may not be degraded and are not subject to a variance procedure. New discharges of pollutants to such waters are prohibited. Existing discharges shall be eliminated unless the discharger is able to demonstrate that: (a) Alternative means of disposal are not reasonably available or feasible; and (b) The discharge will not affect the quality of the water as a national resource.*[33]

This provision explicitly outlines how the State intends to maintain and protect the water quality of ORWs. Another provision which Minnesota uses to control discharges to waters that flow into ORWs for their effect on ORWs is that:

> *The agency shall require new or expanded discharges that flow into outstanding resource value waters [to] be controlled so as to assure no deterioration in the quality of the downstream outstanding resource value water.*[34]

V. USING 401 CERTIFICATION

A. The Permits/Licenses Covered and the Scope of Review

The language of Section 401(a)(1) is written very broadly with respect to the activities it covers. "[A]ny activity, including, but not limited to, the construction or operation of facilities, which may result in any discharge" requires water quality certification.

When the Congress first enacted the water quality certification provision in 1970, it spoke of the "wide variety of licenses and permits . . . issued by various Federal agencies," which "involve activities or operations potentially affecting water quality."[35] The purpose of the water quality certification requirement, the Congress said, was to ensure that no license or permit would be issued "for an activity that through inadequate planning or otherwise could in fact become a source of pollution."[36]

1. Federal Permits/Licenses Subject to Certification

The first consideration is which federal permits or licenses are subject to 401 certification. OWP has identified five federal permits and/or licenses which authorize activities which may result in a discharge to the waters. **These are: permits for point source discharges under Section 402 and discharges of dredged and fill material under Section 404 of the Clean Water Act; permits for activities in navigable waters which may affect navigation under Sections 9 and 10 of the Rivers and Harbors Act (RHA); and licenses required for hydroelectric projects issued under the Federal Power Act.**

There are likely other federal permits and licenses, such as permits for activities on public lands, and Nuclear Regulatory Commission licenses, which may result in a discharge and thus require 401 certification. Each State should work with EPA and the federal agencies active in its State to determine whether 401 certification is in fact applicable.

Indeed, it is not always clear when 401 certification should apply. For instance, there remains some confusion under Sections 9 and 10 of RHA concerning which projects may involve or result in a discharge, and thus require State certification. In many cases there is an overlap between Section 404 CWA and Sections 9 and 10 RHA. Where these permits overlap, 401 certification always applies. Under the Section 404 regulations, the question of whether dredging involves a discharge and is therefore subject to Section 404, depends on whether there is more than "de minimis, incidental soil movement occurring during normal dredging operations".[37]

Where only a Section 9 or 10 permit is required, 401 certification would apply if the activity may lead to a discharge. For example, in the case of pilings, which the Corps sometimes considers subject to Section 10 only, a 401 certification would be required for the Section 10 permit if structures on top of the pilings may result in a discharge.

States should notify the regional office of federal permitting or licensing agencies of their authority to review these permits and licenses (e.g., the Corps of Engineers for Section 404 in nonauthorized States, and Sections 9 and 10 of the RHA; EPA for Section 402 permits in nonauthorized States; and the Federal Energy Regulatory Commission (FERC) for hydropower licenses). In their 401 certification implementing regulations, States should also give notice to applicants for these particular federal permits and licenses, and for all other permits and licenses that may result in a discharge to waters of the State, of their obligation to obtain 401 certification from the State.

West Virginia's 401 certification implementing regulations, for instance, state that:

> *1.1. Scope. . . . Section 401 of the Clean Water Act requires that any applicant for a federal license or permit to conduct an activity which will or may discharge into waters of the United States (as defined in the Clean Water Act) must present the federal authority with a certification from the appropriate State agency. Federal permits and licenses issued by the federal government requiring certification include permits issued by the United States Army Corps of Engineers under Section 404 of the Clean Water Act, 33 U.S.C. 1344 and licenses issued by the Federal Energy Regulatory Commission under the Federal Power Act, 16 U.S.C. 1791 et seq.*[38]

Because West Virginia has been authorized to administer the NPDES permitting program under Section 402 of the Clean Water Act, applicants for NPDES permits do not have to apply for water quality certification separately. In addition, West Virginia has not specifically designated Rivers and Harbors Act permits in the above regulation. However, because the regulation States that such permits or licenses include Section

404 and FERC licenses, those and all other permits not specifically designated but which may result in a discharge to the waters would be covered by the regulation's language. The better approach would be to enumerate all such licenses and permits that are known to the State and include a phrase for all others generically.

2. Scope of Review Under Section 401

An additional issue is the scope of the States' review under Section 401. Congress intended for the States to use the water quality certification process to ensure that no federal license or permits would be issued that would violate State standards or become a source of pollution in the future. Also, because the States' certification of a construction permit or license also operates as certification for an operating permit (except for in certain instances specified in Section 401(a)(3)), it is imperative for a State review to consider all potential water quality impacts of the project, both direct and indirect, over the life of the project.

A second component of the scope of the review is when an activity requiring 401 certification in one State (i.e. the State in which the discharge originates) will have an impact on the water quality of another State.[39] The statute provides that after receiving notice of application from a federal permitting or licensing agency, EPA will notify any States whose water quality may be affected. Such States have the right to submit their objections and request a hearing. EPA may also submit its evaluation and recommendations. If the use of conditions cannot insure compliance with the affected State's water quality requirements, the federal permitting or licensing agency shall not issue such permit or license.

The following example of 401 certification denial by the Pennsylvania Department of Environmental Resources (DER) for a proposed FERC hydroelectric project illustrates the breadth of the scope of review under Section 401 (see Appendix C for full description of project and impacts addressed). The City of Harrisburg, Pennsylvania proposed to construct a hydroelectric power project on the Susquehanna River. The Pennsylvania DER considered a full range of potential impacts on the aquatic system in its review. The impacts included those on State waters located at the dam site, as well as those downstream and upstream from the site. The impacts considered were not just from the discharge initiating the certification review, but water quality impacts from the entire project. Thus, potential impacts such as flooding, changes in dissolved oxygen, loss of wetlands, and changes in groundwater, both from construction and future operation of the project, were all considered in the State's decision.

The concerns expressed by the Pennsylvania Department of Environmental Resources are not necessarily all those that a State should consider in a dam certification review; each project will have its own specific impacts and potential water quality problems. The point of the illustration is to show that **all of the potential effects of a proposed activity on water quality -- direct and indirect, short and long term, upstream and downstream, construction and operation -- should be part of a State's certification review.**

B. Conditioning 401 Certifications for Wetland Protection

In 401(d), the Congress has given the States the authority to place any conditions on a water quality certification that are necessary to assure that the applicant will comply with effluent limitations, water quality standards, standards of performance or pretreatment standards; with any State law provisions or regulations more stringent than those sections; and with "any other appropriate requirement of State law."

The legislative history of the subsection indicates that the Congress meant for the States to impose whatever conditions on the certification are necessary to ensure that an applicant complies with all State requirements that are related to water quality concerns.

1. What are Appropriate Conditions?

There are any number of possible conditions that could be placed on a certification that have as their purpose preventing water quality deterioration.

By way of example, the State of Maryland issued a certification with conditions for placement of fill to construct a 35-foot earthen dam located 200 feet downstream of an existing dam. Maryland used some general conditions applicable to many of the proposed projects it considers, along with specific conditions tailored to the proposed project. Examples of the conditions placed on this particular certification include:

> *The applicant shall obtain and certify compliance with a grading and sediment control plan which has been approved by the [county] Soil Conservation District. The approved plan shall be available at the project site during all phases of construction.*
>
> *Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway. The natural vegetation shall be maintained and restored when disturbed or eroded. Stormwater drainage facilities shall be designed, implemented, operated, and maintained in accordance with the requirements of the applicable approving authority.*

> *The applicant is required to provide a mixing tower release structure to achieve in-stream compliance with Class III trout temperature (20[degrees] C) and dissolved oxygen (5.0 mg/liter) standards prior to the Piney Run/Church Creek confluence. The design of this structure shall be approved by the Maryland Department of the Environment (MDE).*
>
> *The applicant is required to provide a watershed management plan to minimize pollutant loadings into the reservoir. This plan shall be reviewed and approved by MDE prior to operation of the new dam facility. In conjunction with this plan's development any sources of pollutant loading identified during field surveys shall be eliminated or minimized to the extent possible given available technology.*
>
> *The applicant is required to provide to MDE an operating and maintenance plan for the dam assuring minimum downstream flows in accordance with the requirements of the DNR and assuring removal of accumulated sediments with subsequent approved disposal of the materials removed.*
>
> *The applicant is to provide mitigation for the wetlands lost as a result of the construction of this project and its subsequent operation. Wetland recreation should be located in the newly created headwaters areas to: a) assure adequate filtration of runoff prior to its entry into the reservoir and b) replace the aquatic resource being lost on an acre for acre basis.*

See Appendix D for the full list of conditions placed on this certification. While few of these conditions are based directly on traditional water quality standards, all are valid and relate to the maintenance of water quality or the designated use of the waters in some way. Some of the conditions are clearly requirements of State or local law related to water quality other than those promulgated pursuant to the CWA sections enumerated in Section 401(a)(1). Other conditions were designed to minimize the project's adverse effects on water quality over the life of the project.

In addition, Appendix D contains a list of conditions which West Virginia and Alaska placed on the certification of some Section 404 nationwide permits. Many of the West Virginia conditions are typical of ones it uses on individual proposals as well. For any particular project, West Virginia will include more specific conditions designed to address the potential adverse effects of the project in addition to those enumerated in Appendix D. The conditions from Alaska are used on a nationwide permit (#26) regarding isolated waters and waters above headwaters. These conditions are discussed in Section V. C(1).

2. The Role of Mitigation in Conditioning Certification

Many States are trying to determine the role that mitigation should play in 401 certification decisions. We cannot answer this question definitively for each State, but offer as a guide EPA's general framework for mitigation under the Section 404(b)(1) Guidelines used to evaluate applications for Section 404 permits. In assuring compliance of a project with the Guidelines, **EPA's approach is to first, consider avoidance of adverse impacts, next, determine ways to minimize the impacts, and finally, require appropriate and practicable compensation for unavoidable impacts.**

The Guidelines provide for avoiding adverse impacts by selecting the least environmentally damaging practicable alternative. In addition, wetlands are "special aquatic sites." For such sites, if the proposed activity is not "water dependent," practicable alternatives with less adverse environmental impacts are presumed to be available unless the applicant clearly demonstrates otherwise.[40]

The Guidelines also require an applicant to take "appropriate and practicable" steps to minimize the impacts of the least environmentally damaging alternative selected.[41] Examples in the Guidelines for minimizing impacts through project modifications and best management practices are provided in Appendix E.

After these two steps are complete, appropriate compensation is required for the remaining unavoidable adverse impacts. Compensation would consist of restoration of previously altered wetlands or creation of wetlands from upland sites. In most cases, compensation on or adjacent to the project site is preferred over off-site locations. The restoration or creation should be functionally equivalent to the values which are lost. Finally, compensating with the same type of wetland lost is preferred to using another wetland type.

The States may choose to adopt mitigation policies which require additional replacement to help account for the uncertainty in the science of wetland creation and restoration. What is important from EPA's perspective is that mitigation not be used as a trade-off for avoidable losses of wetlands, and that mitigation compensate, to the fullest extent possible, for the functional values provided to the local ecosystem by the wetlands unavoidably lost by the project.

3. The Role of Other State Laws

Another question that has been asked is what State law or other requirements are appropriately used to condition a 401 certification. The legislative history of Section 401(d) indicates that Congress meant for the States to condition certifications on compliance with any State and local law requirements related to water quality preservation. The courts that have touched on the issue have also indicated that conditions that relate in any way to water quality maintenance are appropriate. Each State will have to make these determinations for itself, of course; there are any number of State and local programs that have components related to water quality preservation and enhancement.

One issue that has arisen in two court cases is whether a State may use State law requirements, other than those that are more stringent than the provisions of Sections 301, 302, 303, 306 and 307 of the CWA(401(a)(1)), to deny water quality certification. An Oregon State court has ruled that a State may, and indeed must, include conditions on certifications reflecting State law requirements "to the extent that they have any relationship to water quality." "Only to the extent that [a State law requirement] has absolutely no relationship to water quality," the court said, "would it not be an 'other appropriate requirement of State law.'"[42] State agencies must act in accord with State law, of course, and thus the decision to grant certification carries with it the obligation to condition certification to ensure compliance with such State requirements.

This State court decision struck down a State agency's denial of certification because it was based on the applicant's failure to certify compliance with a county's comprehensive plan and land use ordinances. The court held that such "other appropriate requirement[s] of State law" could not be the basis for denying certification. However, the court held that the agency should determine which of the provisions of the land use ordinances had any relation to the maintenance and preservation of water quality. Any such provisions, the court said, could and should be the basis for conditions placed on a certification.

Another State court, however, this one in West Virginia, has upheld the State's denial of certification on the basis of State law requirements unrelated to the implementation of the CWA provisions enumerated in Section 401(a)(1).[43] The court simply issued an order upholding the State's denial, however, and did not write an opinion on the subject. The questions raised by these two opinions are thorny. If States may not deny certification based on State law requirements other than those implementing the CWA, yet want to address related requirements of State law, they must walk a thin line between their State requirements and the limitations of their certification authority under federal law.

One way to avoid these difficulties and to ensure that 401 certification may properly be used to deny certification where the State has determined that the activity cannot be conditioned in such a way as to ensure compliance with State water quality related requirements, is to adopt water quality standards that include all State provisions related to water quality preservation. Congress has given the States great latitude to adopt water quality standards that take into consideration the waters' use for such things as "the propagation of fish and wildlife, recreational purposes, and . . . other purposes."[44] Because of the broad authority granted by the Congress to the States to adopt water quality standards pursuant to Section 303 of the CWA, and because compliance with Section 303 is clearly one of the bases on which a State can deny certification, the States can avoid the difficulty of the deny/condition dilemma by adopting water standards that include all the water quality related considerations it wishes to include in the 401 certification review.

For example, the State of Washington has included State water right permit flow requirements in its conditions for certification of a dam project. This is one means of helping to ensure that hydrological changes do not adversely affect the quality of a waterbody. However, a more direct approach is to include a narrative criterion in the State's water quality standards that requires maintenance of base flow necessary to protect the wetland's (or other waterbody's) living resources. The State of Kentucky has such a criterion in its water quality standards (see previous section IV. D(1) on "Using Narrative Criteria"). Placing the provision directly in the State standards might better serve the State if a certification is challenged because the requirement would be an explicit consideration of 401 certification.

C. Special Considerations for Review of Section 404 Permits: Nationwide and After-the-Fact Permits

1. Nationwide Permits.

Pursuant to Section 404(e) of the CWA, the Corps may issue general permits, after providing notice and an opportunity for a hearing, on a State, regional or nationwide basis for any category of activities involving discharges of dredged or fill material, where such activities are similar in nature and will cause only minimal adverse environmental effects both individually and cumulatively. These permits may remain in effect for 5 years, after which they must be reissued with notice and an opportunity for a hearing. If the activities authorized by general permits may result in a discharge, the permits are subject to the State water quality certification requirement when they are first proposed and when proposed for reissuance. States may either grant certification with appropriate conditions or deny certification of these permits.

Under the Corps' regulations, if a State has denied certification of any particular general permit, any person proposing to do work pursuant to such a permit must first obtain State water quality certification. If a State has conditioned the grant of certification upon some requirement of State review prior to the activity's commencing, such condition[s] must be satisfied before work can begin.

Some States have reported that for general permits for which they have denied water quality certification or on which they have imposed some condition of review, they are having difficulties ensuring that parties performing activities pursuant to these permits are applying to the State for water quality certification or otherwise fulfilling the conditions placed on the certification prior to the commencement of work under these permits.

At least one State is grappling with the problem through its 401 certification implementing regulations. The State of West Virginia denied certification for some nationwide permits issued by the Corps and conditioned the granting of certification for others. One of the conditions that West Virginia has imposed on those certifications that it granted (which thus apply to all nationwide permits in the State) is compliance with its 401 certification implementing regulations. The regulations in turn require that any person authorized to conduct an activity under a nationwide permit must, prior to conducting any activity authorized by a Corps general permit, publish a Class I legal advertisement in a qualified newspaper in the county where the activity is proposed to take place. The notice must describe the activity, advise the public of the scope of the conditionally granted certification, the public's right to comment on the proposed activity and its right to request a hearing. The applicant must forward a certificate of publication of this notice to the State agency prior to conducting any such activity.[45]

The regulation further provides that any person whose property, interest in property or "other constitutionally protected interest under [the West Virginia Constitution] [is] directly affected by the Department's certification" may request a hearing within 15 days of the publication of the notice given by the applicant. The agency will then decide whether to "uphold, modify or withdraw certification for the individual activity."

West Virginia program officers have described the reasons for this procedure:

> *Because of a long-standing concern . . . that untracked dredge and fill activities could prove disastrous on both individual and cumulative bases, the regulations require an authorized permittee [under federal law] to forward proof of publication and a copy of the newspaper advertisement. The information on the notice is logged into a computer system and a site specific inspection sheet is generated. Inspectors then may visit the site to determine compliance with permit conditions and to evaluate cumulative impacts.*[46]

Without such notice and a tracking system of activities performed under these permits, such as that adopted by West Virginia, it will be difficult for a State to evaluate whether or not to grant or deny water quality certification for these permits when they come up for reissuance by the Corps or to condition them in such a way as to avoid adverse impacts peculiar to each of these general permits. It is advisable for the States, regardless of whether they have granted or denied certification, to adopt as part of their 401 certification implementing regulations, provisions addressing these concerns for general permits.

Another way in which some States are attempting to minimize the potential environmental impact of nationwide permits is by stringently conditioning their certification. Alaska, for instance, placed conditions on nationwide permit 26 regarding isolated waters and waters above the headwaters. One of the conditions Alaska used excludes isolated or headwater wetlands of known or suspected high value. When there is uncertainty about a particular wetland, the Corps is required to send pre-discharge notification to designated State officials for a determination. (See Appendix D for a full description of conditions on nationwide permit 26).

2. Section 404 After-the-Fact Permits

The Corps of Engineers' regulations implementing Section 404 provide for the acceptance of after-the-fact permit applications for unauthorized discharges except under certain circumstances. Several States have expressed concern with after-the-fact permits, including the belief that once the discharges have taken place, the water quality certification process is moot. Because of that belief, many States report that they waive certification for after-the-fact permits. Such an approach frustrates law enforcement efforts generally and the water quality certification process in particular because it encourages illegal activity.

The evaluation of after-the-fact permit applications should be no different than for normal applications. Because the burden should be on the applicant to show compliance with water quality standards and other CWA requirements, rather than waiving certification, States could deny certification if the applicant cannot show from baseline data prior to its activity that the activity did not violate water quality standards. If data exist to determine compliance with water quality standards, the States' analysis should be no different merely because the work has already been partially performed or completed. Arkansas denied after-the-fact water quality certification of a wetland fill as follows:

> *[a certain slough] is currently classified as a warmwater fishery . . . . Draining and clearing of [its associated] wetlands will significantly alter the existing use by drastically reducing or eliminating the fishery habitat and spawning areas. This physical alteration of the lake will prevent it from being "water which is suitable for the propagation of indigenous warmwater species of fish" which is the definition of a warmwater fishery. Thus, the . . . project [violates] Section 3 (A) of the Arkansas Water Quality Standards, "Existing instream water uses and the level of water quality necessary to protect the*

existing uses shall be maintained and protected." The Department recommends the area be restored to as near original contours as possible.

With after-the-fact permits, just as with any other permit application, if the State denies certification, the Corps is prohibited from granting a permit. If the applicant refuses to restore the area and does not have a permit, the applicant is subject to a potential enforcement action for restoration and substantial penalties for the unpermitted discharge of pollutants by the EPA, the Corps, a citizen under the citizen suit provision of the CWA, or by the State, if the activity violates a prohibition of State law.

If the State determines that it will get a better environmental result by conditioning certification, it may choose to take that approach. The condition might require mitigation for the filled area (where restoration may cause more environmental harm than benefit, for instance) with restoration or creation of a potentially more valuable wetland area.

In any event, a State should not waive certification of an after-the-fact permit application simply because it is after-the-fact.

VI. DEVELOPING 401 CERTIFICATION IMPLEMENTING REGULATIONS: ADDITIONAL CONSIDERATIONS

A comprehensive set of 401 certification implementing regulations would have both procedural and substantive provisions which maximize the State agency's control over the process and which make its decisions defensible in court. The very fact of having 401 certification regulations goes a long way in providing the State agency that implements 401 certification with credibility in the courts. Currently, no State has "ideal" 401 certification implementing regulations, and many do not have them at all. When 401 certification regulations are carefully considered, they can be very effective not only in conserving the quality of the State's waters, but in providing the regulated sectors with some predictability of State actions, and in minimizing the State's financial and human resource requirements as well.

Everything in this handbook relates in some way to the development of sound water quality standards and 401 certification implementing regulations that will enhance wetland protection. This section addresses some very basic procedural considerations of 401 certification implementing regulations which have not been treated elsewhere. These include provisions concerning the contents of an application for certification; the agency's timeframe for review; and the requirements placed on the applicant in the certification process.

A. Review Timeframe and "Complete" Applications

Under Section 401(a)(1) a State will be deemed to have waived certification if it fails to act within "a reasonable period of time (which shall not exceed one year) after receipt of such request." Program managers should keep in mind that the federal permitting or license agency may have regulations of its own which provide a time limit for the State's certification decision. For instance, Corps regulations say that a waiver "will be deemed to occur if the certifying agency fails or refuses to act on a request for certification within sixty days after receipt . . . unless the district engineer determines a shorter or longer period is reasonable . . . ."[47] FERC rules state that a certifying agency "is deemed to have waived the certification requirements if . . . [it] has not denied or granted certification by one year after the date the certifying agency received the request".[48] EPA regulations for Section 402 in non-authorized States set a limit of 60 days unless the Regional Administrator finds that unusual circumstances require a longer time.[49]

States should coordinate closely with the appropriate federal agency on timing issues. For example, Alaska negotiated joint EPA/State procedures for coastal NPDES permit review. The agreement takes into account and coordinates EPA, Coastal Zone Management, and 401 certification time frames.

It is also advisable for the States to adopt rules which reasonably protect against an unintended waiver due, for example, to insufficient information to make a certification decision or because project plans have changed enough to warrant a reevaluation of the impacts on water quality. Thus, after taking the federal agencies' regulations into account, the State's 401 certification regulations should link the timing for review to what is considered receipt of a complete application.

Wisconsin, for instance, requires the applicant to submit a complete application for certification before the official agency review time begins. The State's regulations define the major components of a complete application, including the existing physical environment at the site, the size of the area affected, all environmental impact assessment information provided to the licensing or permitting agency, and the like. The rules State that the agency will review the application for completeness within 30 days of its receipt and notify the applicant of any additional materials reasonably necessary for review. Although the application will be deemed "complete" for purposes of review time if the agency does not request additional materials within 40 days of receipt of the application, the agency reserves the right to request additional information during the review process.[50]

In the case of FERC projects, West Virginia has taken additional precautions with regard to time for review:

> *If the project application is altered or modified during the FERC licensing process prior to FERC's final decision, the applicant shall inform the Department of such changes. The Department may review such alterations or modifications and, if the changes are deemed significant by the Director, the Department may require a new application for certification. The Department will have ninety (90) days to review such changes or until the end of the year review period . . . , whichever is longer, to determine whether to require a new application or to alter its original certification decision. If the department requires a new application because of a significant application modification, then the Department will have six (6) months to issue its certification decision from the date of submission of the application.*[51]

B. Requirements for the Applicant

It is very important, in particular for conserving the agency's resources and ensuring that there is sufficient information to determine that water quality standards and other provisions of the CWA will not be violated by the activity, to clarify that it is the applicant who is responsible for providing or proving particular facts or requirements.

For instance, Section 401(a)(1) requires that a State "establish procedures for public notice in the case of all applications for certification." West Virginia requires applicants for FERC licenses to be responsible for this notice. In the case of Section 404 permits, West Virginia has a joint notice process with the Corps to issue public notices for 404 applications which also notify the public of the State certification process. Thus, there is no need for West Virginia to require the applicant to do so for these permits.[52]

A second consideration is that States should require the applicant to demonstrate the project's compliance with applicable federal and State law and regulation. EPA's 401 certification regulations name the sources of information a State should use as that contained in the application and other information "furnished by the applicant" sufficient to allow the agency to make a statement that water quality standards will not be violated.[53] Of course in addition, the regulations also refer to other information the agency may choose to examine which is not furnished by the applicant.

Ohio, for instance, has written a requirement for the applicant to demonstrate compliance into its 401 certification implementing regulations:

> *(A) The director shall not issue a Section 401 water quality certification unless he determines that the applicant has demonstrated that the discharge of dredged or fill material to waters of the state or the creation of any obstruction or alteration in waters of the state will:*[54] *(1) Not prevent or interfere with the attainment or maintenance of applicable water quality standards; (2) Not result in a violation of any applicable provision of the following sections of the Federal Water Pollution Control Act [301, 302, 303, 306 and 307].*
>
> *(B) Notwithstanding an applicant's demonstration of the criteria in paragraph (A) . . . the director may deny an application for a Section 401 water quality certification if the director concludes that the discharge of dredged or fill material or obstructions or alterations in waters of the state will result in adverse long or short term impact on water quality.*[55]

C. Permit Fees

A very significant concern for all States who plan to initiate or expand their 401 certification program is the availability of funding. Application fee requirements are a potential funding source to supplement State program budgets. The State of California's Regional Water Quality Control Boards require filing fees for 401 certification applications unless a Board determines that certification is not required. The fee structure is spelled out in the California Water Code. The money collected from the fees goes into the State agency's general fund. The Regional Boards may recover some portion of the fees through the budget request process. The State of Ohio also has a fee structure for 401 certification applicants. In Ohio, however, fees go into the State's general fund, rather than back into the State agency. Neither State collects fees sufficient to support the 401 certification program fully. Despite these potential barriers, application fees could provide a much needed funding source which States should explore.

D. Basis for Certification Decisions

The regulations should also set out the grounds on which the decision to grant or deny certification will be based, the scope of the State's review, and the bases for conditioning a certification. If a State has denied water quality certification for a general permit or has conditioned such a permit on some requirement of State review, the State's 401 certification implementing regulations might also outline the obligations of a person proposing to accomplish work under such a permit. The following is a hypothetical example of regulatory language a State might use to define the grounds for the State's decision to grant, condition, or deny certification:

> In order to obtain certification of any proposed activity that may result in a discharge to waters of the United States, an applicant must demonstrate that the entire activity over its lifetime will not violate or interfere with the attainment of any limitations or standards contained in Section 301, 302, 303, 306, and 307, the federal regulations promulgated pursuant thereto, and any provisions of state law or regulation adopted pursuant to, or which are more stringent than, those provisions of the Clean Water Act.
>
> The agency may condition certification on any requirements consistent with ensuring the applicant's compliance with the provisions listed above, or with any other requirements of state law related to the maintenance, preservation, or enhancement of water quality.

This sample regulatory language provides the grounds for the certification decision, sets the scope of review (lifetime effects of the entire activity) and clearly States that the applicant must demonstrate compliance. For purposes of conditioning the certification in the event it is granted, the same standards can be applied, with the addition of any other requirements of State law that are related to water quality.

Regulations are not project specific. They must be generally applicable to all projects subject to 401 certification review, while at the same time providing reasonable notice to an applicant regarding the general standards employed by the agency in the certification process. (A State may choose to adopt license/permit-specific regulations for 401 certification, but such regulations will still have to be applicable to all activities that may occur pursuant to that license or permit).

There are other considerations that should be addressed in 401 certification implementing regulations, some of which have been mentioned in other parts of this handbook. These include provisions which require applicants for federal licenses and permits which may result in a discharge to apply for water quality certification; provisions which define waters of the State to include wetlands and which define other pertinent terms; and provisions addressing general permits.

VII. EXISTING AND EMERGING SOURCES OF DATA TO AID 401 CERTIFICATION AND STANDARDS DECISION MAKERS

According to a number of State program managers, more data on wetland functions, or "uses," would greatly assist the certification process. Wetland ecosystems not only perform a wide variety of functions but do so in varying degrees. Public agencies and private applicants currently employ a number of assessment methods such as the Wetlands Evaluation Technique and the Habitat Evaluation Procedure to determine what functions or uses exist in a particular wetland system.[56] In many States, however, water quality certification reviewers lack the resources to perform even a simple assessment of a wetland's boundaries, values and functions. Information about the location and types of wetland systems, and of the functions they may perform (such as flood storage, habitat, pollution attenuation, nutrient uptake, and sediment fixing) would aid standard writers in developing appropriate uses and criteria for wetlands, and allow 401 certification officials to conduct a more thorough review.

Several States already have extensive knowledge of their wetland resources, and data gathering efforts are also being undertaken by EPA, the U.S. Fish and Wildlife Service and other agencies.[57] Although these efforts to inventory and classify wetlands have not been closely tied to the 401 certification process in the past, these existing data can be valuable sources of information for 401 certification reviewers. It is important to remember, however, that wetland boundaries for regulatory purposes may differ from those identified by National Wetland Inventory maps for general inventory purposes. The EPA, Corps of Engineers, Fish and Wildlife Service, and Soil Conservation Service have adopted a joint manual for identifying and delineating wetlands in the United States. The manual will be available in June, 1989.[58]

There are several programs that offer technical support for 401 certification decisions. For example, approximately forty States have worked with the Nature Conservancy to establish "natural heritage programs," which identify the most critical species, habitats, plant communities, and other natural features within a State's territorial boundaries. Most States now have a State natural heritage office to coordinate this identification program. Inventory efforts such as the natural heritage program could give 401 certification managers some of the information they need to limit or prohibit adverse water quality impacts in important wetland areas. Specifically, the inventory process can identify existing wetland uses in order to maintain them. The information may also be used in identifying wetlands for Outstanding Resource Waters designation.[59]

The Fish and Wildlife Service maintains a Wetlands Values Data Base which may be very useful in identifying wetland functions and in designating wetland uses for water quality standards. The data base is on computer and contains an annotated bibliography of scientific literature on wetland functions and values.[60] Several States have established critical area programs to identify and protect unique and highly sensitive land and water resources. These programs can provide data to the State water quality certification office and thereby strengthen the scientific basis for 401 certification decision making.[61]

Another potential source of information which might identify wetlands appropriate for designation as Outstanding Resource Waters are the wetland plans which each State is required to develop to comply with the 1986 Emergency Wetlands Resources Act. Beginning in fiscal year 1988, Statewide Comprehensive Outdoor Recreation Plans (SCORP) must now contain a Wetlands Priority Conservation Plan approved by the Department of Interior. Although these plans are primarily focused on wetlands for acquisition, they are a potential source of data on wetland locations and functions. The wetlands identified may also be suitable for special protection under the Outstanding Resource Waters provisions of the antidegradation policy.

The Advance Identification program (ADID), conducted by EPA and the permitting authority, may also furnish a considerable amount of useful information. EPA's 404(b)(1) Guidelines contain a procedure for identifying in advance areas that are generally suitable or unsuitable for the deposit of dredged or fill material.[62] In recent years, EPA has made greater use of this authority. ADID is often used in wetland areas that are experiencing significant development or other conversion pressures. Many ADID efforts generate substantial data on the location and functions of wetlands within the study area such as wetland maps, and habitat, water quality, or hydrological studies.

Special Area Management Plans (SAMPs) are another planning process which may yield useful information. SAMPs refer to a process authorized by the 1980 amendments to the Coastal Zone Management Improvement Act, which provides grants to States to develop comprehensive plans for natural resource protection and "reasonable coastal-dependent economic growth."[63] The SAMP process implicitly recognizes the State water quality certification process, directing all relevant local, State, and federal authorities to coordinate permit programs in carrying out the completed SAMP. The Corps of Engineers has supported and initiated several of these processes. In addition, other SAMPs have been completed by several States.

Much of these data can be collected, combined, and used in decision making with the aid of geographic-based computer systems that can store, analyze, and present data related to wetlands in graphic and written forms.[64] A reviewing official can quickly access and overlay a range of different existing information bases such as flora and fauna inventories, soil surveys, remote sensing data, watershed and wetland maps, existing uses and criteria, and project proposal information.

Finally, data is presently emerging on the use of wetlands as treatment areas for wastewater, stormwater, and non-point discharges.[65] Florida, for instance, has adopted a rule on wastewater releases into wetlands.[66] Florida prohibits wastewater discharges into the following kinds of wetlands: those designated as outstanding waters of the State; wetlands within potable water supplies; shellfish propagation or harvesting waters; wetlands in areas of critical State concern; wetlands where herbaceous ground cover constitutes more than thirty percent of the uppermost stratum (unless seventy-five percent is cattail); and others. Wastewater discharges are permitted in certain wetlands dominated by woody vegetation, certain hydrologically altered wetlands, and artificially created wetlands; however, the State applies special effluent limitations to take account of a wetland's ability to assimilate nitrogen and phosphorus. It also applies qualitative[67] and quantitative[68] design criteria.

The rule establishes four "wetland biological quality" standards. First, the flora and fauna of the wetland cannot be changed so as to impair the wetland's ability to function in the propagation and maintenance of fish and wildlife populations or substantially reduce its effectiveness in wastewater treatment. Second, the Shannon-Weaver diversity index of benthic macroinvertebrates cannot be reduced below fifty percent of background levels. Third, fish populations must be monitored and maintained, and an annual survey of each species must be conducted. Fourth, the "importance value" of any dominant plant species in the canopy and subcanopy at any monitoring station cannot be reduced by more than fifty percent, and the average "importance value" of any dominant plant species cannot be reduced by more than twenty-five percent.[69]

These types of efforts, constantly being adjusted to take account of new information in a field where knowledge is rapidly expanding, are fertile sources of information for wetland standard writers and 401 certification decision makers.

VIII. SUMMARY OF ACTIONS NEEDED

This handbook has only scratched the surface of issues surrounding effective use of 401 certification to protect wetlands. The preceding discussion and examples from active States have highlighted possible approaches for all States to incorporate into their 401 certification programs. The handbook shows that there are many things that a State can act on right away to improve the effectiveness of 401 certification to protect the integrity of its wetlands. At the same time, there are improvements to water quality standards for wetlands which will have to take place within a longer timeframe.

A. Steps States Can Take Right Away

- **All states should begin by explicitly incorporating wetlands into their definitions of state waters in both state water quality standards regulations, and in state 401 certifications regulations.**

- **States should develop or modify their regulations and guidelines for 401 certification and water quality standards to clarify their programs, codify their decision process, and to incorporate special wetlands considerations into the more traditional water quality approaches.**

- **States should make more effective use of their existing narrative water quality standards (including the antidegradation policy) to protect wetlands.**

- **States should initiate or improve upon existing inventories of their wetland resources.**

- **States should designate uses for their wetlands based on estimates of wetland functions typically associated with given wetland types. Such potential uses could be verified for individual applications with an assessment tool such as the Wetlands Evaluation Technique or Habitat Evaluation Procedure.**

- **States should tap into the potential of the outstanding resource waters tier of the antidegradation policy for wetlands. It may not be an appropriate designation for all of a state's wetlands, but it can provide excellent protection to particularly valuable or ecologically sensitive wetlands from both physical and chemical degradation.**

- **States should incorporate wetlands and 401 certification into their other water quality management processes. Integrating this tool with other mechanisms such as coastal zone management programs, point and nonpoint source programs, and water quality management plans will help fill the gaps of each individual tool and allow better protection of wetlands systems from the whole host of physical, chemical, and biological impacts.**

Time and the courts may be needed to resolve some of the more complicated and contentious issues surrounding 401 certification such as which federal permits and licenses require 401 certification. EPA intends to support States in resolving such issues.

OWP, in cooperation with the Office of Water Regulations and Standards (OWRS), will build on this 401 certification handbook by developing guidance in FY 89-90 on water quality standards for wetlands. The guidance will provide the framework for States to incorporate wetlands into their water quality standards. The guidance will: require States to include wetlands as "waters of the State;" provide methods to designate wetland uses that recognize differences in wetland types and functions; address some chemical-specific and narrative biological criteria for wetlands; and discuss implementation of State antidegradation policies.

B: Laying the Groundwork for Future Decisions

Many States are successfully applying their existing narrative and, to a lesser extent, numeric water quality criteria to their wetland resources. Nevertheless, more work is needed to test the overall adequacy and applicability of these standards for wetlands, and to develop additional criteria where needed.

For example, existing criteria related to pH do not account for the extreme natural acidity of many peat bogs nor the extreme alkalinity of certain fens. Also, many existing criteria focus too extensively on the chemical quality of the water column without adequately protecting the other physical and biological components which are an integral part of wetland aquatic systems. Some numeric criteria for chemicals may not be protective enough of species (particularly bird species) which feed, breed, and/or spend a portion of their life cycle in wetlands. Hydrological changes can have severe impacts on wetland quality, but these changes are rarely addressed in traditional water quality standards.

Research of interest to State programs is being sponsored by the Wetlands Research Program of EPA's Office of Research and Development (ORD). Research covers three areas: Cumulative Effects, Water Quality, and Mitigation. Although these efforts will be developed over several years, interim products will be distributed to the States. States may find these products of use when developing criteria and standards, when identifying and designating wetlands as outstanding resource waters, and when making 401 certification decisions.

Cumulative Effects:

EPA's research on cumulative effects of wetlands takes a regional perspective. Through a series of regional pilot studies involving landscape analyses, ORD is correlating water quality conditions at the outlets of major watersheds with the percentage of wetlands in these watersheds. The types of wetlands, their position, and non-wetland factors are also being analyzed. The results will allow water quality managers in these regions to specify the optimal percentage and combination of various types of wetlands needed to maintain water quality of lakes and rivers. Such watershed criteria could be used to guide efforts to create or restore wetlands for the purpose of intercepting and improving the quality of nonpoint runoff.

The pilot studies will also determine which wetland features can be used to predict wetland functions. Once differences among wetlands can be identified based on their functions, it will be possible to classify particular wetlands with regard to specific designated uses.

The cumulative effects program is using the results of the pilot studies as technical support for developing a "Synoptic Assessment Method". This method has already been used to rank watersheds within certain regions, according to the likely cumulative benefits of their wetlands. Also, sources of information useful for designating uses of individual wetlands were described by ORD in EPA's draft guidance for Advance Identification Appendix D.[70] Information on regionally rare or declining wetland wildlife, which could be used as one basis for establishing "special aquatic areas" in selected wetlands, is also available from the ORD Wetlands Research Team at the Corvallis EPA Lab.

Water Quality:

Another ORD study, being implemented through the Duluth Lab, is examining impacts to the water quality and biota of 30 wetlands, before and after regional development. This study will be useful, as part of 401 certification, for developing performance standards for activities which may affect wetland water quality.

Several research projects being proposed by the Wetland Research Program could produce information very useful to water quality managers. These are described in ORD's publication, "Wetlands and Water Quality: A Research and Monitoring Implementation Plan for the Years 1989-1994". Many of these proposals are planned, but will hinge upon funding decisions in future budget years. Those which drew the most support from a 1988 EPA workshop of scientists and State program administrators were as follows:

- **Water Quality Criteria to Protect Wetland Function.** Existing quality criteria for surface waters would be reviewed for applicability to wetlands. Methods for biological and chemical monitoring of wetlands would be refined, and a field manual produced.

- **Ecological Status and Trends of the Wetland Resource.** A nationwide network would be established to monitor the wetland resource. Field surveys would define the expected range of numerical values within each region for particular chemicals and especially, for biological community metrics, across a gradient of sites ranging from nearly-pristine to severely disturbed.

- **Waste Assimilative Limits of Wetlands.** Observable features which determine the long-term ability of wetlands to retain contaminants and nutrients would be tested. "Safe" loading limits for various substances would be proposed for specific wetland types or regions. Similar kinds of information would also become available from a research effort focused specifically on artificial wetlands and coordinated by EPA-Cincinnati, in cooperation with the Corvallis and Duluth Labs. That study would recommend engineering design factors essential in wetlands constructed by municipalities for tertiary wastewater treatment.

Mitigation:

Information useful to 401 certification will also originate from ORD'S mitigation research. This research aims to determine if created and restored wetlands replace functions lost by wetland destruction permitted under Section 404. The research is organized to (1) synthesize current knowledge on wetland creation and restoration, (2) compile 404 permit information on created and restored wetlands, and (3) compare created and naturally occurring wetlands. Research results will be incorporated into a "Mitigation Handbook" useful for designing and evaluating mitigation projects. A literature synthesis being developed as a Provisional Guidance Document will be available in 1989. A provisional version of the handbook will be produced in 1990. This will assist States in identifying areas at greatest risk due to 404 permit activities and thus help target 401 certification and water quality standards activities.

APPENDIX A

Provided below are State 401 certifictation contacts and EPA wetlands contacts who can provide assistance in applying 401 to wetlands.

EPA has asked the Council of State Governments (CSG) to maintain a database of State wetland contacts and programs. In order to help keep the database up to date, please contact CSG when you have changes in your program or staff contacts, or if you come across inaccuracies in other State programs. You can access this database using virtually any computer with a modem. In order to obtain your free username and password contact:

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APPENDIX B
FEDERAL DEFINITIONS

The federal definition of "waters of the United States" is (40 CFR Section 232.2(q)):

(1) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(2) All interstate waters including interstate wetlands;
(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which would or could affect interstate or foreign commerce including any such waters:

    (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    (ii) From which fish or shellfish could be taken and sold in interstate or foreign commerce;
    (iii) Which are used or could be used for industrial purposes by industries in interstate commerce;*

(4) All impoundments of waters otherwise defined as waters of the United States under this definition;
(5) Tributaries of waters identified in paragraphs 1-4.
(6) The territorial sea;
(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in 1-6; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR § 423.11(m) which also meet criteria in this definition) are not waters of the United States.

(* Note: EPA has clarified that waters of the U.S. under the commerce connection in (3) above also include, for example, waters:
Which are or would be used as habitat by birds protected by Migratory Bird Treaties or migratory birds which cross State lines;
Which are or would be used as habitat for endangered species;
Used to irrigate crops sold in interstate commerce.)

The federal definition of "wetlands" (40 CFR § 232.2(r)). Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

APPENDIX C

SCOPE OF PROJECT REVIEW: PENNSYLVANIA DAM PROPOSAL EXAMPLE

The dam proposed by the City of Harrisburg was to be 3,000 feet long and 17 feet high. The dam was to consist of 32 bottom hinged flap gates. The dam would have created an impoundment with a surface area of 3,800 acres, a total storage capacity of 35,000 acre feet, and a pool elevation of 306.5 feet. The backwater would have extended approximately eight miles upstream on the Susquehanna River and approximately three miles upstream on the Conodoguinet Creek.

The project was to be a run-of-the-river facility, using the head difference created by the dam to create electricity. Maximum turbine flow would have been 10,000 cfs (at a nethead of 12.5) and minimum flow would have been 2,000 cfs. Under normal conditions, all flows up to 40,000 cfs would have passed through the turbines.

The public notice denying 401 certification for this project stated as follows:

1. The construction and operation of the project will result in the significant loss of wetlands and related aquatic habitat and acreage. More specifically:
    a. The destruction of the wetlands will have an adverse impact on the local river ecosystem because of the integral role wetlands play in maintaining that ecosystem.

    b. The destruction of the wetlands will cause the loss of beds of emergent aquatic vegetation that serve as habitat for juvenile fish. Loss of this habitat will adversely affect the relative abundance of juvenile and adult fish (especially smallmouth bass).

    c. The wetlands which will be lost are critical habitat for, among other species, the yellow crowned night heron, black crowned night heron, marsh wren and great egret. In addition, the yellow crowned night heron is a proposed State threatened species, and the marsh wren and great egret are candidate species of special concern.

    d. All affected wetlands areas are important and, to the extent that the loss of these wetlands can be mitigated, the applicant has failed to demonstrate that the mitigation proposed is adequate. To the extent that adequate mitigation is possible, mitigation must include replacement in the river system.

e. Proposed riprapping of the shoreline could further reduce wetland acreage. The applicant has failed to demonstrate that there will not be an adverse water quality and related habitat impact resulting from riprapping.

f. Based upon information received by the Department, the applicant has underestimated the total wetland acreage affected.

2. The applicant has failed to demonstrate that there will be no adverse water quality impacts from increased groundwater levels resulting from the project. The ground water model used by the applicant is not acceptable due to erroneous assumptions and the lack of a sensitivity analysis. The applicant has not provided sufficient information concerning the impact of increased groundwater levels on existing sites of subsurface contamination, adequacy of subsurface sewage system replacement areas and the impact of potential increased surface flooding. Additionally, information was not provided to adequately assess the effect of raised groundwater on sewer system laterals, effectiveness of sewer rehabilitation measures and potential for increased flows at the Harrisburg wastewater plant.

3. The applicant has failed to demonstrate that there will not be a dissolved oxygen problem as a result of the impoundment. Present information indicates the existing river system in the area is sensitive to diurnal, dissolved oxygen fluctuation. Sufficient information was not provided to allow the Department to conclude that dissolved oxygen standards will be met in the pool area. Additionally, the applicant failed to adequately address the issue of anticipated dissolved oxygen levels below the dam.

4. The proposed impoundment will create a backwater on the lower three miles of the Conodoguinet Creek. Water quality in the Creek is currently adversely affected by nutrient problems. The applicant has failed to demonstrate that there will not be water quality degradation as a result of the impoundment.

5. The applicant has failed to demonstrate that there will not be an adverse water quality impact resulting from combined sewer overflows.

6. The applicant has failed to demonstrate that there will not be an adverse water quality impact to the 150 acre area downstream of the proposed dam and upstream from the existing Dock Street dam.

7. The applicant has failed to demonstrate that the construction and operation of the proposed dam will not have an adverse impact on the aquatic resources upstream from the proposed impoundment. For example, the suitability of the impoundment for smallmouth bass spawning relative to the frequency of turbid

conditions during spawning was not adequately addressed and construction of the dam and impoundment will result in a decrease in the diversity and density of the macroinvertebrate community in the impoundment area.

8. Construction of the dam will have an adverse impact on upstream and downstream migration of migratory fish (especially shad). Even with the construction of fish passageways for upstream and downstream migration, significant declines in the numbers of fish successfully negotiating the obstruction are anticipated.

9. The applicant has failed to demonstrate that there will not be an adverse water quality impact related to sedimentation within the pool area.

APPENDIX D

EXAMPLES OF CERTIFICATION CONDITIONS

****MARYLAND****

Maryland certified with conditions the fill/alteration of 6.66 acres of non-tidal wetlands as part of the construction of an 18 hole golf course and a residential subdivision. Approximately three-fourths of the entire site of 200 acres had been cleared for cattle grazing and agricultural activities in the past. As a result, a stream on the east side of the property with no buffer had been severely degraded. An unbuffered tractor crossing had also degraded the stream. A palustrine forested wetland area on the southeast side of the property received stormwater runoff from a highway bordering the property and served as a flood storage and ground water recharge area. Filling this area for construction of a fairway would eliminate some 4.5 acres of wetlands. Additionally, other smaller wetland areas on the property, principally around an old farm pond that was to be fashioned into four separate ponds for water traps, were proposed to be altered or lost as a result of the development.

The Corps did not exercise its discretionary authority to require an individual permit and thus the project was permitted under a nationwide permit (26). The State decided to grant certification, conditioned on a number of things that it believed would improve the water quality of the stream in the long run.

The filled wetland areas had to be replaced on an acre-for-acre basis on the property and in particular, the 4.5 acre forested palustrine wetland had to be replaced onsite with a wetland area serving the same functions regarding stormwater runoff from the highway.

Some of the other conditions placed on the certification were as follows:

1. The applicant must obtain and certify compliance with a grading and sediment control plan approved by the [name of county] Soil Conservation District;

2. Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway. Stormwater drainage facilities shall be designed, implemented, operated and maintained in accordance with the requirements of the [applicable county authority];

3. The applicant shall ensure that fish species are stocked in the ponds upon completion of the construction phase in accordance with the requirements of the [fisheries division of the natural resources department of the State];

4. The applicant shall ensure that all mitigation areas are inspected annually by a wetlands scientist to ensure that all wetlands are functioning properly;

5. A vegetated buffer shall be established around the existing stream and proposed ponds;

6. Biological control methods for weed, insects and other undesirable species are to be employed whenever possible on the greens, tees, and fairways located within or in close proximity to the wetland or waterways;

7. Fertilizers are to be used on greens, tees, and fairways only. From the second year of operation, all applications of fertilizers at the golf course shall be in the lower range dosage rates [specified]. The use of slow release compounds such as sulfur-coated urea is required. There shall be no application of fertilizers within two weeks of verticutting, coring or spiking operations.

** WEST VIRGINIA **

THE FOLLOWING GENERAL CONDITIONS APPLY TO ALL NATIONWIDE PERMITS IN WEST VIRGINIA:

1. Permittee will investigate for water supply intakes or other activities immediately downstream which may be affected by suspended solids and turbidity increases caused by work in the watercourse. He will give notice to operators of any such water supply intakes before beginning work in the watercourse in sufficient time to allow preparation for any change in water quality.

2. When no feasible alternative is available, excavation, dredging or filling in the watercourse will be done to the minimum extent practicable.

3. Spoil materials from the watercourse or onshore operations, including sludge deposits, will not be dumped into the water course or deposited in wetlands.

4. Permittee will employ measures to prevent or control spills from fuels, lubricants, or any other materials used in construction from entering the watercourse.

5. Upon completion of earthwork operations, all fills in the watercourse or onshore and other areas disturbed during construction, will be seeded, riprapped, or given some other type of protection from subsequent soil erosion. If riprap is utilized, it is to be of such weight and size that bank stress or slump conditions will not be created due to its placement. Fill is to be clean and of such composition that it will not adversely effect the biological, chemical or physical properties of the receiving waters.

6. Runoff from any storage areas or spills will not be allowed to enter storm sewers without acceptable removal of solids, oils and toxic compounds. All spills will promptly be reported to the appropriate Department of Natural Resources office.

7. Best Management Practices for sediment and erosion control as described in the 208 Construction Water Quality Management Plan are to be implemented.

8. Green concrete will not be permitted to enter the watercourse unless contained by tightly sealed forms or cells. Concrete handling equipment will not discharge waste washwater into the watercourse or wetlands without adequate wastewater treatment.

9. No instream work is permissible during the fish spawning season April through June.

10. Removal of mature riparian vegetation not directly associated with project construction is prohibited.

11. Instream equipment operation is to be minimized and should be accomplished during low flow periods.

12. Nationwide permits are not applicable for activities on Wild and Scenic Rivers or study streams, streams on the Natural Streams Preservation List or the New River Gorge National River. These streams include New River (confluence with Gauley to mouth of Greenbrier); Greenbrier River (mouth to Knapps Creek), Birch River (mouth to Cora Brown Barge in Nicholas County), Anthony Creek, Cranberry Run, Bluestone River, Gauley River, and Meadow River.

13. Each permittee shall follow the notice requirements contained in Section 9 of the Department of Natural Resources Regulations for State Certification of Activities Requiring Federal Licenses and Permits, Chapter 20-1, Series XIX (1984).

14. Each permittee shall, if he does not understand or is not aware of applicable Nationwide Permit conditions, contact the Corps of Engineers prior to conducting any activity authorized by a nationwide permit in order to be advised of applicable conditions.

EXAMPLES OF CERTIFICATION CONDITIONS REQUIRED FOR NATIONWIDE PERMIT 26 FROM ALASKA

(26) Discharges of dredged or fill material into the waters listed in subparagraph (i) and (ii) of this paragraph which do not cause the loss or substantial adverse modification of 10 acres or more of waters of the United States, including wetlands. For discharges which cause the loss or substantial adverse modification of 1 to 10 acres of such waters, including wetlands, notification of the District Engineer is required in accordance with 330.7 of this part (see Section 2 of this Public Notice).

(i) Non-tidal rivers, streams, and their lakes and impoundments, including adjacent wetlands, that are located above the headwaters.

(ii) Other non-tidal waters of the United States, including adjacent wetlands, that are not part of the surface tributary system to interstate waters or navigable waters of the United States (i.e., isolated waters).

REGIONAL CONDITION H: Work in a designated anadromous fish stream is subject to authorization from the Alaska Department of Fish and Game. (No change from REGIONAL CONDITION H previously published in SPN 84-7.)

REGIONAL CONDITION J:

a. If, during review of the pre-discharge notification, the Corps of Engineers or the designated State of Alaska reviewing officials determine that the proposed activity would occur in any of the following areas, the applicant will be advised that an individual 404 permit will be required. Where uncertainty exists, the Corps will send pre-discharge notification to the designated State officials for a determination.

1. National Wildlife Refuges
2. National Parks and Preserves
3. National Conservation Areas
4. National Wild and Scenic Rivers
5. National Experimental Areas
6. State Critical Habitat AReas
7. State Sanctuaries
8. State Ranges and Refuges
9. State Eagle Preserves
10. State Ecological Reserves and Experimental Areas
11. State Recreation Areas

12. Wetlands contiguous with designated anadromous fish streams
13. Headwaters and isolated wetlands in designated public water supply watersheds of Craig, Hoonah, Hydaburg, Anchorage, Cordova, Seldovia and Kodiak
14. Sitka Area: Wetlands in the Swan Lake Area Meriting Special Attention (AMSA) in the district Coastal Management Plan
15. Anchorage area: Designated Preservation and Conservation Wetlands in the Wetlands Management Plan
16. Bethel area: Designated Significant Wetlands in the district Coastal Management Plan not covered under General Permit 83-4
17. Hydaburg area: The six AMSA's of the district Coastal Management Plan
18. Bering Strait area: All designated conservation AMSA's of the district Coastal Management Plan
19. Juneau area: Designated Sensitive Wetlands of the district Coastal Management Plan
20. NANA: Designated Special Use Areas and Restricted/ Sensitive areas in the district Coastal Management Plan
21. Tanana Basin Area Plan: type A-1 wetlands in the Alaska Rivers Cooperative State/Federal Study
22. Susitna Area Plan: type A-1 wetlands in the Alaska Rivers Cooperative State/Federal Study
23. High value headwaters and isolated wetlands identified once the ongoing Wetlands Management Plans or Guides listed in b-5 (below) are completed
24. Alaska Natural Gas Pipeline Corridor designated type A and B wetlands
25. Headwaters and isolated waters which include identified bald eagle, peregrine falcon, and trumpeter swan nesting areas
26. ADF&G identified waterfowl use areas of statewide significance
27. Designated caribou calving areas.

Any individual permit issued in locations covered by district coastal management plans, State or Federal regional wetlands plans or local wetlands plans (numbers 14 through 23 above) will be consistent with the plan provisions for the specific wetland type and may require adding stipulations.

Oil and gas activities in the North Slope Borough which involve the discharge of dredged or fill material into waters including wetlands are not covered by the previous nationwide permit under 33 CFR 330.4(a) and (b) and are not covered under the nationwide permit 26. These activities require individual 404 permits or other general permits. These activities were previously excluded by the Corps of Engineers Special Public Notice 84-3 dated March 9, 1984.

b. Pre-discharge notification received by the Corps of Engineers for the discharge of dredged or fill material in the following areas will be provided to designated State agencies which include (1) the appropriate ADEC Regional Environmental Supervisor, (2) the appropriate ADF&G Regional Habitat Supervisor, (3) the appropriate DGC regional contact point, and (4) the appropriate DNR regional contact (should DNR indicate interest in receiving notices).

1. Headwater tributaries of designated anadromous fish streams and their adjacent contiguous wetlands
2. Open water areas of isolated wetlands greater than 10 acres and lakes greater than 10 acres above the headwaters
3. North Slope Borough wet and moist tundra areas not already covered by APP process
4. Wet and moist tundra areas outside the North Slope Borough
5. High value headwaters and isolated wetlands identified in the following ongoing State or Federal wetland management guides or plans: Mat-Su, Kenai Borough, Valdez, North Star Borough Yukon Delta and Copper River Basin
6. Headwater or isolated wetlands within local CZM district boundaries or the identified coastal zone boundary, whichever is geographically smaller (not withstanding the requirements under "a." 14.20 (above))
7. Anchorage Area: designated Special Study areas in the Wetlands Management Plan
8. Tanana Basin Area Plan: areas designated A-2, B-1, B-2 in the Alaska River Cooperative State/Federal Study
9. Susitna Area Plan: areas designated A-2, A-3, A-4 in the Alaska River Cooperative State/Federal Study

The designated officials of the State of Alaska, and the Corps will evaluate the notifications received for the areas listed "b." above under the provisions set forth in 33 CFR 330.7 (see Section 2 of this Public Notice) which includes an evaluation of the environmental effects using the guidelines set forth in Section 404(b)(1) of the Clean Water Act. Notices shall be screened against the nationwide conditions under 330.5(b) (See Section 4 of the Public Notice) using available resource information. Conditions 330.5(b)(1), (2), (3), (4), (6), and (7) and (9) will be focused on during the State review.

The State's review of these areas under "b." above will encompass the following:

1. After receiving pre-discharge notification from the Corps, the State of Alaska shall comment verbally, and/or if time permits, in writing to the Corps District Engineer through a single State agency concerning the need for an individual permit review.

2. Existing fish and wildlife atlases and field knowledge shall be used to evaluate notices. If significant resource values are not identified for the area in question or if insufficient resource information exists, State agencies will not request an individual permit unless:

(a) An on-site field evaluation will be conducted, weather permitting, during the extended review provided under the individual permit, or;

(b) Federal resource agencies plan a similar field evaluation that could provide identical information to State resource agencies.

Should either the State review or the Corps review determine that the nationwide permit is not applicable, an individual 404 permit will be required.

New categories may be added at a later date should either the Corps or the State of Alaska recognize a need. These changes will be made available for public review through a public notice and comment period at the appropriate time.

This REGIONAL CONDITION shall be effective for the period of time that nationwide permit 26 is in effect unless the REGIONAL CONDITION is sooner revoked by the Department of the Army with prior coordination with the State of Alaska.

APPENDIX E

Federal Register / Vol. 45. No. 249 / Wednesday. December 24. 1980 / Rules and Regulations 85355

Subpart H—Actions To Minimize Adverse Effects

Note.—There are many actions which can be undertaken in response to § 230.10(d) to minimize the adverse effects of discharges of dredged or fill material. Some of these, grouped by type of activity, are listed in this subpart.

§ 230.70 Actions concerning the location of the discharge.

The effects of the discharge can be minimized by the choice of the disposal site. Some of the ways to accomplish this are by:

(a) Locating and confining the discharge to minimize smothering of organisms;

(b) Designing the discharge to avoid a disruption of periodic water inundation patterns;

(c) Selecting a disposal site that has been used previously for dredged material discharge;

(d) Selecting a disposal site at which the substrate is composed of material similar to that being discharged, such as discharging sand on sand or mud on mud;

(e) Selecting the disposal site, the discharge point, and the method of discharge to minimize the extent of any plume;

(f) Designing the discharge of dredged or fill material to minimize or prevent the creation of standing bodies of water in areas of normally fluctuating water levels, and minimize or prevent the drainage of areas subject to such fluctuations.

§ 230.71 Actions concerning the material to be discharged.

The effects of a discharge can be minimized by treatment of, or limitations on the material itself, such as:

(a) Disposal of dredged material in such a manner that physiochemical conditions are maintained and the potency and availability of pollutants are reduced.

(b) Limiting the solid, liquid, and gaseous components of material to be discharged at a particular site;

(c) Adding treatment substances to the discharge material;

(d) Utilizing chemical flocculants to enhance the deposition of suspended particulates in diked disposal areas.

§ 230.72 Actions controlling the material after discharge.

The effects of the dredged or fill material after discharge may be controlled by:

(a) Selecting discharge methods and disposal sites where the potential for erosion, slumping or leaching of materials into the surrounding aquatic ecosystem will be reduced. These sites or methods include, but are not limited to:

(1) Using containment levees, sediment basins, and cover crops to reduce erosion;

(2) Using lined containment areas to reduce leaching where leaching of chemical constituents from the discharged material is expected to be a problem;

(b) Capping in-place contaminated material with clean material or selectively discharging the most contaminated material first to be capped with the remaining material;

(c) Maintaining and containing discharged material properly to prevent point and nonpoint sources of pollution;

(d) Timing the discharge to minimize impact, for instance during periods of unusual high water flows, wind, wave, and tidal actions.

§ 230.73 Actions affecting the method of dispersion.

The effects of a discharge can be minimized by the manner in which it is dispersed, such as:

(a) Where environmentally desirable, distributing the dredged material widely in a thin layer at the disposal site to maintain natural substrate contours and elevation;

(b) Orienting a dredged or fill material mound to minimize undesirable obstruction to the water current or circulation pattern, and utilizing natural bottom contours to minimize the size of the mound;

(c) Using silt screens or other appropriate methods to confine suspended particulate/turbidity to a small area where settling or removal can occur;

(d) Making use of currents and circulation patterns to mix, disperse and dilute the discharge;

(e) Minimizing water column turbidity by using a submerged diffuser system. A similar effect can be accomplished by submerging pipeline discharges or otherwise releasing materials near the bottom;

(f) Selecting sites or managing discharges to confine and minimize the release of suspended particulates to give decreased turbidity levels and to maintain light penetration for organisms;

(g) Setting limitations on the amount of material to be discharged per unit of time or volume of receiving water.

§ 230.74 Actions related to technology.

Discharge technology should be adapted to the needs of each site. In determining whether the discharge operation sufficiently minimizes adverse environmental impacts, the applicant should consider:

(a) Using appropriate equipment or machinery, including protective devices, and the use of such equipment or machinery in activities related to the discharge of dredged or fill material;

(b) Employing appropriate maintenance and operation on equipment or machinery, including adequate training, staffing, and working procedures;

(c) Using machinery and techniques that are especially designed to reduce damage to wetlands. This may include machines equipped with devices that scatter rather than mound excavated materials, machines with specially designed wheels or tracks, and the use of mats under heavy machines to reduce wetland surface compaction and rutting;

(d) Designing access roads and channel spanning structures using culverts, open channels, and diversions that will pass both low and high water flows, accommodate fluctuating water levels, and maintain circulation and faunal movement;

(e) Employing appropriate machinery and methods of transport of the material for discharge.

§ 230.75 Actions affecting plant and animal populations.

Minimization of adverse effects on populations of plants and animals can be achieved by:

(a) Avoiding changes in water current and circulation patterns which would interfere with the movement of animals;

(b) Selecting sites or managing discharges to prevent or avoid creating habitat conducive to the development of undesirable predators or species which have a competitive edge ecologically over indigenous plants or animals;

(c) Avoiding sites having unique habitat or other value, including habitat of threatened or endangered species;

(d) Using planning and construction practices to institute habitat development and restoration to produce a new or modified environmental state of higher ecological value by displacement of some or all of the existing environmental characteristics. Habitat development and restoration techniques can be used to minimize adverse impacts and to compensate for destroyed habitat. Use techniques that have been demonstrated to be effective in circumstances similar to those under consideration wherever possible. Where proposed development and restoration techniques have not yet advanced to the pilot demonstration stage, initiate their use on a small scale to allow corrective action if unanticipated adverse impacts occur.

(e) Timing discharge to avoid spawning or migration seasons and other biologically critical time periods;

(f) Avoiding the destruction of remnant natural sites within areas already affected by development.

§ 230.76 Actions affecting human use.

Minimization of adverse effects on human use potential may be achieved by:

(a) Selecting discharge sites and following discharge procedures to prevent or minimize any potential damage to the aesthetically pleasing features of the aquatic site (e.g. viewscapes), particularly with respect to water quality;

(b) Selecting disposal sites which are not valuable as natural aquatic areas;

(c) Timing the discharge to avoid the seasons or periods when human recreational activity associated with the aquatic site is most important;

(d) Following discharge procedures which avoid or minimize the disturbance of aesthetic features of an aquatic site or ecosystem.

(e) Selecting sites that will not be detrimental or increase incompatible human activity, or require the need for frequent dredge or fill maintenance activity in remote fish and wildlife areas;

(f) Locating the disposal site outside of the vicinity of a public water supply intake.

§ 230.77 Other actions.

(a) In the case of fills, controlling runoff and other discharges from activities to be conducted on the fill;

(b) In the case of dams, designing water releases to accommodate the needs of fish and wildlife.

(c) In dredging projects funded by Federal agencies other than the Corps of Engineers, maintain desired water quality of the return discharge through agreement with the Federal funding authority on scientifically defensible pollutant concentration levels in addition to any applicable water quality standards.

(d) When a significant ecological change in the aquatic environment is proposed by the discharge of dredged or fill material, the permitting authority should consider the ecosystem that will be lost as well as the environmental benefits of the new system.

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Attachment L

SWAMPBUSTING:
WETLAND CONVERSION AND FARM PROGRAMS

United States
Department of
Agriculture

Economic
Research
Service

Agricultural
Economic
Report
Number 551

Swampbusting: Wetland Conversion and Farm Programs

Ralph E. Heimlich
Linda L. Langner

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Abstract

Farmers who grow annual crops on converted wetlands, a practice popularly known as swampbusting, will be denied all farm program benefits under the Food Security Act of 1985. Denying price supports to operators converting wetlands can be an effective sanction in some situations, but may be less effective where tax breaks are the main motive for conversion. Although remaining wetlands may be productive if converted, high conversion costs probably make most wetlands unprofitable to convert. Further, the high social value of existing wetlands may outweigh the value of increased agricultural production through conversion, particularly in wetland areas critical for wildlife habitat.

Keywords: Wetland conversion, swampbusting, drainage, potential cropland, farm programs, conservation, wetland functions.

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Summary

Farmers who grow annual crops on converted wetlands, a practice popularly known as swampbusting, will be denied all farm program benefits under the Food Security Act of 1985. Denying price supports to operators converting wetlands can be an effective sanction in some situations, but may be less effective where tax breaks are the main motive for conversion. Although remaining wetlands may be productive if converted, high conversion costs probably make most wetlands unprofitable to convert. Further, the high social value of existing wetlands may outweigh the value of increased agricultural production through conversion, particularly in wetland areas critical for wildlife habitat.

Extent of the problem. Agricultural conversion was responsible for the loss of 12 million acres of wetlands between the mid-1950's and mid-1970's. In 1982, some 78.4 million acres of non-Federal wetlands remained. Privately owned wetlands available for conversion totaled 59.5 million acres.

Farm programs and wetlands. Of private wetlands suited to conversion, 72 percent (42.9 million acres) would be productive if converted to cropland. Deficiency payments would help offset high clearing and drainage costs that are the principal obstacles to converting these wetlands, but may not be sufficient to ensure longrun profitability. Only 5.1 million acres of remaining wetlands were judged to have high or medium potential for conversion to cropland in 1982.

Income taxes. Denying price-support payments to representative farms converting wetlands reduced after-tax income 26 to 144 percent. Income tax breaks on land improvements for extensive, high-cost conversions can offset loss of price support payments, especially where the owner has large nonfarm income to shelter from taxes. Denying price supports will discourage wetland conversions when deficiency payments are a large part of net farm income and either conversion costs or nonfarm incomes are low.

Conversion costs. The physical process of converting wetlands for crop production differs across regions and results in widely varying conversion costs. Annual conversion costs can range from less than $20 per acre in the prairie pothole region of Minnesota to almost $200 per acre for North Carolina pocosin wetlands. The importance of farm program subsidies falls as conversion costs increase, while the size of income tax subsidies rises along with conversion costs.

Wetland values. Wetlands provide habitat for fish and wildlife, reduce floods and improve water quality, and provide recreational and renewable resources. Benefits from existing wetlands may outweigh the social value of additional production of surplus crops through conversion, at least in critical wetland areas.

Prospects. The drop in farm prices since 1981 may discourage all conversions to cropland, including wetland conversions. Nevertheless, prohibiting payment of farm program subsidies to operators of converted wetlands will ensure greater consistency between USDA resource programs and commodity support programs. Eliminating income tax deductions for land clearing and for soil and water conservation activities related to wetland conversion would also remove incentives for conversion. However, indirect motivations for conversion—associated with timber harvest, removing nuisance wetlands in existing fields, and lowering water tables through irrigation pumping and flood-control channels—will continue despite sanctions in farm and tax legislation.

Swampbusting
Wetland Conversion and Farm Programs

Ralph E. Heimlich and Linda L. Langner*

Introduction

Public concern with the environment has forced a reevaluation of our attitudes toward wetlands, those frontiers between land and water where so much wildlife finds a home and fisheries are nurtured. Utilitarian views of wetlands—as latent resources awaiting reclamation for "useful" purposes—conflict with environmental concerns about loss of wetland habitat. Agriculture has been an important element in wetland conversion: about 87 percent of recent wetland losses involved draining and clearing wetlands for farming (*28*).[1]

Development of farmland in response to higher commodity prices in the 1970's was responsible for faster conversion of wetlands. Inconsistency between agricultural production goals and conservation goals was a persistent theme in public meetings and in a public opinion poll conducted in conjunction with the 1980 Resource Conservation Assessment (*12*). Even though official USDA policy seeks to "minimize the destruction, loss or degradation of wetlands..." (Executive Order 11990), Government price-support and credit programs are presumed to be an important incentive in private decisions to convert land for farming. Provisions in the 1985 farm act deny farm program benefits both to operators who plow up highly erodible land, a practice termed "sodbusting," and operators who grow annual crops on converted wetlands, called "swampbusting" (*17*). Critics argue that farm programs should not support cropland converted from wetlands when the Water Bank Program and other Federal wildlife habitat programs seek to preserve wetlands.

Laws directly and indirectly regulating wetland conversions exist at the Federal level and in 30 States. Under Section 404 of the Clean Water Act, the Army Corps of Engineers regulates the discharge of dredged or filled material onto wetlands. However, excavation, drainage, clearing, and flooding of wetlands are not explicitly covered, so many inland conversions do not require a 404 permit. The Office of Technology Assessment (OTA) found that of the 300,000 acres of wetlands converted annually, more than 80 percent were unregulated. Corps estimates for 1980-81 indicate that of all permits filed, about half the acreage was approved for conversion with no significant modification. The 404 program and State regulatory programs are most effective at preventing coastal wetland conversion, while inland wetlands most vulnerable to agricultural conversion are not effectively regulated (*28*).

To address this problem, legislation was introduced in the 99th Congress to deny farm program benefits to operators who convert wetlands for crop production. The wetland conservation provision (Title XII C.) of the Food Security Act of 1985 (P.L. 99-198) makes an operator ineligible for price-support payments, farm storage facility loans, crop insurance, disaster payments, and insured or guaranteed loans for any year in which an annual crop was produced on converted wetlands. An operator would retain eligibility if the land were converted before enactment of the legislation, or if crop production were possible in the wetland's natural state or due to natural conditions such as drought. Wetlands are defined as "land that has a predominance of hydric soils and that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support... a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions" (P.L. 99-198).

This report investigates the implications of the swampbuster provision by presenting data on remaining wetlands and analyzing their potential for conversion to farmland. Background on past losses of wetlands is presented, and trends from recent data are examined. Salient characteristics of remaining wetlands are described and their physical potential for agricultural conversion assessed. The economics of converting wetlands for farm program crop production are analyzed with and without farm program benefits. The effects of incentives for conversion provided by the Federal income tax code are discussed. A description of wetland values foregone by conversion to cropland is followed by an analysis of farming potential in critical wetland problem areas. The report ends with conclusions and implications for policy.

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[1] Italicized numbers in parentheses refer to sources cited in the References section.

Extent and Location of Wetland Conversion

Estimates of historical wetland acreage in the United States range from 127 million acres (*45*) to 185 million acres (*28*). Comparing these estimates to the best current estimate of 99 million acres of remaining wetlands (*13*) reveals a loss of 22 to 46 percent of the original wetland acreage that European settlers found on arriving here. There are a variety of data estimating wetland acreage at various times, none of it uniform in scope or definition (see app. 1). Despite the flawed nature of these data for assessing trends, a review of the different estimates provides useful background to the problem of wetland conversion.

Long-term Trends

The U.S. Congress gave 64.9 million acres of wetlands to 15 States in the Swamp Land Acts of 1849, 1850, and 1860. Comparison of recent estimates of wetland acreage in these States indicates that 19 percent of this acreage was lost by the mid-1970's (table 1). Six of the 15 States appeared to have added 8.9 million acres of wetlands between 1849 and the mid-1970's, but this probably reflects incomplete accounting for all wetlands under the acts. The remaining nine States lost 21.3 million acres, or 40 percent of their wetlands.

The first national wetlands inventory, conducted in 1954, estimated 74.4 million acres of wetlands, classified according to 20 types (*38*). In 1979, a more comprehensive analysis using aerial photographs estimated that there had been 108.2 million acres of wetlands in the 1950's (*13*).

Wetland Terms

- Hydric soil: A soil "...that in its undrained condition is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation" (*48*).

- Wetland systems: Wetlands and deepwater habitats that share the influence of similar hydrologic, geomorphologic, chemical, or biological factors. Five major systems are recognized (see (*8*) for details):

  Marine—Open ocean overlying the continental shelf and its associated high-energy coastline.

  Estuarine—Deepwater tidal habitats and adjacent tidal wetlands that are usually partly enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land.

  Riverine—All wetlands and deepwater habitats contained within a channel, except for wetlands dominated by trees, shrubs, persistent emergent plants, mosses, or lichens, and habitats containing ocean-derived salts above 0.5 o/oo (parts per thousand).

  Lacustrine—Wetlands and deepwater habitats with all of the following features: 1) situated in a topographic depression or a dammed river channel; 2) lacking trees, shrubs, and persistent emergent plants, mosses, or lichens covering more than 30 percent of the area; and 3) with a total area exceeding 20 acres.

  Palustrine—All nontidal wetlands dominated by trees, shrubs, and persistent emergent plants, mosses, or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 o/oo (parts per thousand).

- Pocosin wetland (the name is derived from an Algonquin word meaning "swamp on a hill"): These wetlands are unique to the southeastern coastal plain from Virginia to northern Florida. They lie in broad, flat upland areas away from large streams and are covered by evergreen forest and scrub-shrub vegetation (*32, 43*).

- Prairie pothole wetland: These wetlands were formed from melting ice fragments in glacial times. They are widespread shallow depressions, mostly less than 2 feet deep and varying from less than one to several hundred acres (*43*). Many potholes are only seasonally wet and can resemble dry land in periods of drought.

The 1977 National Resources Inventory (NRI), by USDA's Soil Conservation Service, used the 1954 classification system. Only wetland types 3-20 on non-Federal land were counted, even though most agricultural conversion of wetlands occurs in the seasonally flooded basins and flats and inland fresh meadows of types 1 and 2. A total of 41.5 million acres of non-Federal wetland types 3-20 were inventoried; USDA estimated that an additional 29 million acres of types 1 and 2 remained in 1977, for a total of 70.5 million acres of wetlands.

A more recent NRI in 1982 counted 78.4 million acres of non-Federal wetlands of which 44.5 million acres were in types 3-20, an increase of 3 million acres over the 1977 estimate. The 1982 inventory counted 31.7 million acres of wetland types 1 and 2, about 40 percent of the total. If wetland types 1 and 2 were in roughly the same proportion in 1977, the 41.5 million acres of types 3-20 imply a total of 69.2 million acres of non-Federal wetlands. Allowing for higher losses of types 1 and 2, the original estimate of 70.5 million acres of non-Federal wetlands in 1977 appears reasonable.

Using a statistical sample of wetlands identified from aerial photographs, the U.S. Fish and Wildlife Service (FWS) estimated that 99 million acres of wetlands remained in the mid-1970's. The 1982 NRI counted 78.4 million acres of non-Federal wetlands remaining in 1982. The 20.7-million-acre difference is partly wetlands in Federal ownership and partly additional losses of wetlands since the mid-1970's.

Table 1—Patented swamplands and remaining wetlands, 1849 and mid-1970's

State	Patented 1849-60[1]	Remaining 1970's[2]	Difference	
	Million acres			Percent
Florida	20.3	11.3	-9.0	-44.3
Arkansas	7.7	2.8	-4.9	-63.6
Missouri	3.4	.8	-2.6	-76.5
California	2.2	.4	-1.8	-81.8
Indiana	1.3	.3	-1.0	-76.9
Louisiana	9.5	8.7	-.8	-8.4
Illinois	1.5	.8	-.7	-46.7
Iowa	1.2	.8	-.4	-33.3
Michigan	5.7	5.6	-.1	-1.8
Subtotal	52.8	31.5	-21.3	-40.3
Ohio	*	.5	.5	1,795.2
Mississippi	3.3	4.1	.8	24.2
Wisconsin	3.4	4.4	1.0	29.4
Oregon	.3	1.4	1.1	366.6
Alabama	.4	3.1	2.7	675.0
Minnesota	4.7	7.5	2.8	59.6
Subtotal	12.1	21.0	8.9	73.5
Total	64.9	52.5	-12.4	-19.1

* = Fewer than 100,000 acres.

[1] Wetlands given to States by congressional action. Not all original wetlands were patented in all States (*38*).

[2] (*13*).

Estimates of federally owned wetlands are surprisingly difficult to obtain. The Fish and Wildlife Service controls 32 million acres of palustrine wetlands and 2 million acres of estuarine wetlands; however, only 5 million acres are in the continental United States, with the remaining majority in Alaska (*43*). Estimates of Federal wetland holdings collected by Dale Pierce of the Department of Interior (table 2) show 12.5 million wetland acres under Federal ownership or lease in the lower 48 States. Without better data for Federal wetland acreage, however, no estimate of losses between the mid-1970's and 1980's is possible from these sources.

The various estimates of wetland acreage discussed here and in appendix 1 are summarized in figure 1. Rates of wetland conversion implied by the estimates vary widely from period to period. Between 1850 and 1919, wetland conversion ranged from 193,000 to 1 million acres per year. Between 1919 and the mid-1950's, conversion slowed to a rate of 177,000 acres per year. An average of 460,000 acres of wetlands were lost each year between the mid-1950's and the mid-1970's. No estimate of total Federal and non-Federal wetlands exists for 1982, so a conversion rate cannot be calculated.

The firmest conclusion that can be drawn from these data is that the highest rate of wetland loss since the turn of the century occurred in the 1960's and 1970's. Wetland conversion rates have probably been somewhat lower since the end of the 1970's (*28*), but there are few data to support this assertion.

Table 2—Estimated Federal wetland holdings, 1985

Agency	Wetlands
	Million acres
Fish and Wildlife Service[1]	5.0
Forest Service[2]	2.9
National Park Service	1.9
Bureau of Land Management	1.4
Army Corps of Engineers	1.0
Bureau of Reclamation	.2
Other agencies	.1
Total	12.5

[1] Excludes 29 million acres of Alaskan wetlands (*43*).

[2] Excludes 9 million acres of Alaskan wetlands.

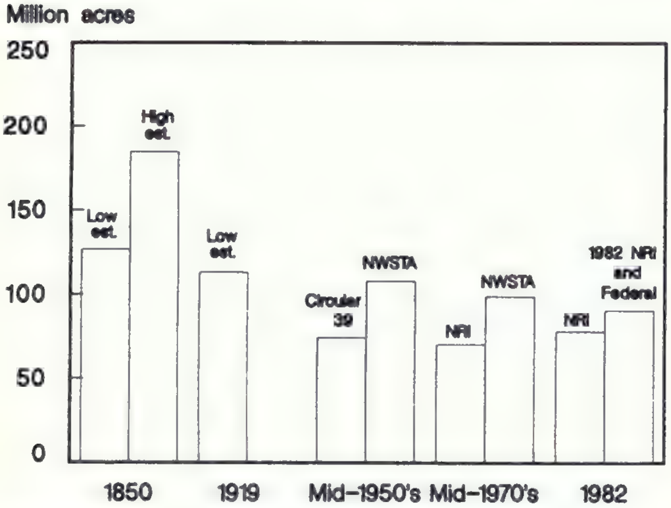
Source: Dale Pierce, Dept. of Interior.

Location of Wetland Change

Loss of wetlands between the mid-1950's and mid-1970's was concentrated in the Southeast and Lower Mississippi (fig. 2). Louisiana and Mississippi lost more than 1.7 million acres of wetland each, Arkansas lost more than 1.5 million acres, and Florida lost more than 1.4 million acres of wetlands.

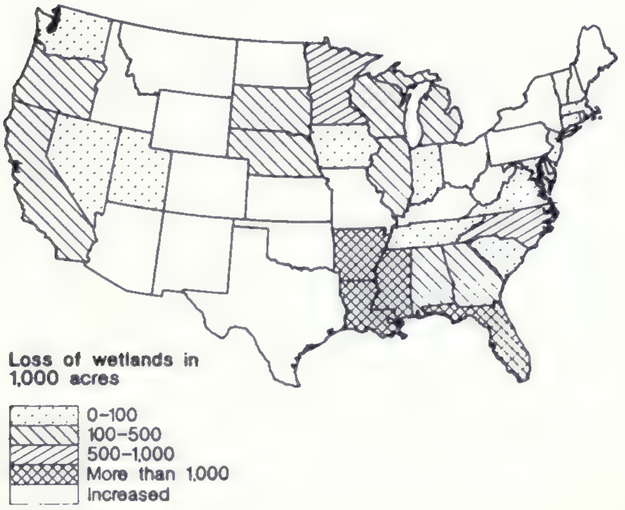
Wetland losses in the North Carolina pocosin area and in Minnesota's prairie pothole region were also substantial, with more than 500,000 acres lost in each. Wetland loss in these six States was primarily due to agricultural conversion.

Figure 1
Changes in U.S. wetlands, 1850-1982



Source: (13, 14, 28, 38, 43, 53, 54)

Figure 2
Wetland loss mid-1950's to mid-1970's



Source: (13)

Wetland Conversion for Agriculture

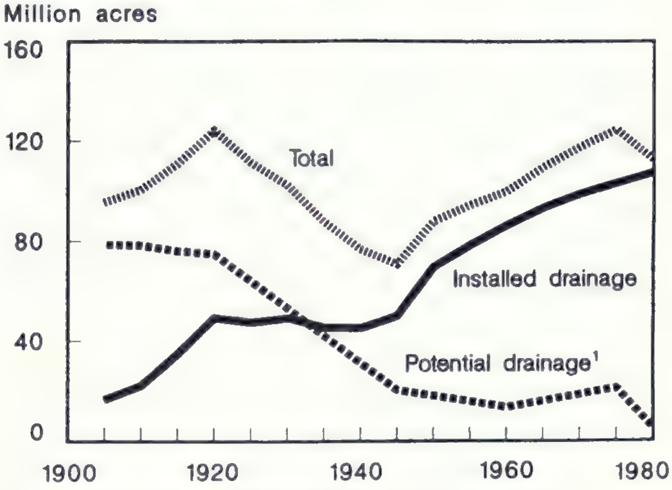
Given the exploitive attitude toward natural resources that prevailed in the late 19th and early 20th centuries, it is not surprising that most interest in wetlands centered on their potential for conversion to "useful" purposes, mainly agriculture. Six surveys were conducted between 1906 and 1982 to assess, among other things, the agricultural potential of remaining wetlands across the Nation (see app. 1). There was little attempt to use consistent wetland defintions or comprehensiveness of coverage in these inventories. Consequently, they provide little information for assessing long-term trends in wetland loss. They do, however, reflect changes in the perception of wetlands as a resource for potential conversion to farming.

Historical data on drainage have been developed for analysis of investments in natural resource capital (30). While drainage is often installed on land that is merely wet, not wetland, these data include information on wetlands that have been converted.

Figure 3 shows the results of the six conversion potential assessments and Pavelis' data on installed drainage. These data allow comparison of conversion potentials perceived by Government officials and by farmers actually investing in drainage. Drainage potential is based on the six inventories and interpolated linearly for 5-year intervals between inventories, so it is comparable with the data on drainage installation.

Drained land increased dramatically during the first 20 years of the 20th century, leveled off during the

Figure 3
Installed and potential drainage, United States, 1905-80



1/ Interpolated from 1907, 1919, 1946, 1958, 1967, 1977, and 1982 data.
Source: (2, 14, 30, 51, 52, 53, 57).

agricultural depression and World War II, and then increased at a slowly declining rate in the postwar period. Estimates of remaining potential for agricultural drainage declined steadily as drainage was actually accomplished. Government assessments of drainage potential remained low in the 1960's and early 1970's, reflecting USDA policy denying technical and financial assistance for drainage (9). However, drainage installation during this period increased, partly because of more optimistic private assessments of drainage potential and partly because of drainage improvements on existing cropland.

More expansive assessments of drainage potential on new cropland in the mid-1970's were tempered by environmental activism, which gradually forced an awareness of the importance of wetlands for wildlife and fisheries. Low official estimates of wetlands suitable for drainage exclude all but the most favorable candidates. Even with the economic prospects faced by farmers today, private wetland owners may see potential profit in converting wetlands for farming. There are few barriers to prevent such conversion.

According to the National Wetlands Status and Trends Analysis (table 3), 87 percent of the 13.8 million acres of wetlands lost in the 1950's and 1960's were converted to farmland (*13*). Virtually all of these were classed vegetated palustrine in the most recent Fish and Wildlife Service system (8). While some may have been converted directly to farmland, about half were originally forested and thus may have entered agricultural use after being cut for timber.

Table 3—Sources and uses of converted wetlands, United States, mid-1950's to mid-1970's

Wetland system converted	Use of land converted			
	Agriculture	Urban	All other	Total
	Million acres			
Palustrine:				
Vegetated—				
Forested	6.2	0.4	0.2	6.8
Emergent	4.6	.4	.3	5.3
Scrub/shrub	1.0	.1	*	1.1
Subtotal	11.7	.9	.6	13.3
Nonvegetated	.1	*	.1	.2
Total	11.8	1.0	.7	13.5
Lacustrine	.1	*	*	.2
Estuarine	*	.2	*	.2
Marine	0	*	*	*
Total[1]	12.0	1.1	.7	13.8

* = Fewer than 100,000 acres.

[1] Detail may not add to total due to rounding.

Source: National Wetland Status and Trends Analysis (*13*).

Remaining Wetlands

Several key characteristics of remaining non-Federal wetlands inventoried in the 1982 NRI (USDA Soil Conservation Service), put wetlands subject to agricultural conversion into perspective.

Characteristics of Remaining Wetlands

Most non-Federal wetlands are privately owned (table 4). States own about 13 percent of non-Federal wetlands. Almost all palustrine wetlands, those most likely to be farmed, are owned privately.

Remaining wetlands were classified by their land cover in the 1982 NRI. Slightly more than half of all non-Federal wetlands inventoried are forested. Of these 42.7 million acres, about a third are in the oak-gum-cypress forest typical of southeastern wet hardwood forests, and about 15 percent each are in the oak-hickory and spruce-fir types of more northern wet woodlands. The swampbuster provision in the 1985 farm act applies to "converted wetlands" (Sec. 1201(4)(A), P.L. 99-198), implying that forested wetlands drained to permit timber harvest would be ineligible for farm programs if brought into crop production after removal of the timber. Hence, this sanction would apply to all wetlands converted in the history of agricultural development, regardless of past ownership or uses between conversion and crop production—an interpretation that would be hard to enforce. (For this analysis, the farm operator is assumed to clear the land for crop production.)

The second largest land cover category (20.9 percent) in which wetlands were classed in the 1982 NRI is "other lands," a residual category. About 17 percent of wetlands are in pasture and range. Only 5.6 percent of wetlands is in crops and all of this is palustrine wetlands.

Table 4—Ownership of non-Federal wetlands, 1982

Owner	Wetland system[1]		
	Palustrine	Other	Total non-Federal
	Million acres		
Private	59.9	5.4	65.3
Government			
State	8.3	2.1	10.4
Local	1.7	.1	1.8
Indian tribes	.8	*	.8
Total	70.7	7.7	78.4

* = Fewer than 100,000.

[1] Defined in (8).

Source: 1982 National Resources Inventory, USDA Soil Conservation Service.

The use of inventoried wetlands differs from their land cover (table 5). About 50 percent of wetlands are used for wood production, while 20 percent are used for agriculture. Seven percent of wetlands are designated for wild uses such as refuges and parks. More than 20 percent of wetlands are idle or could not be assigned a use, again indicating the residual nature of much wetland. Palustrine wetlands make up almost all the agricultural uses as well as all forest used for wood production ("wood production" means that no other specific use is designated for a forested wetland).

Farm Potential of Remaining Wetlands

Since the vast majority of wetlands converted to farming from the mid-1950's to the mid-1970's were palustrine, assessment of wetland conversion potential can be restricted to that class. Almost all wetlands (96 percent) inventoried in 1982 were palustrine (table 6). USDA restricts technical assistance for agricultural drainage to seasonally flooded basins or flats and inland fresh meadows, which are wetland types 1 and 2 in the classification of Circular 39 (50). In 1982 about 44 percent of palustrine wetlands were wetland types 1 and 2. Thus, a total of 70.7 million acres of non-Federal wetlands could be converted to farmland, and 31.4 million acres would be eligible for USDA technical assistance for drainage.

Table 5—Use of non-Federal wetlands, 1982

Land use	Wetland system[1] Palustrine	Other	Total
	Million acres		
Agriculture	14.4	0.5	14.9
Crop production	4.1	0	4.1
Grazing	10.3	.5	10.8
Wood production	40.3	0	40.3
Designated wild[2]	4.2	1.3	5.5
Urban uses[3]	.4	.1	.5
None of the above	11.4	5.8	17.2
Total	70.7	7.7	78.4

[1] Defined in (8).

[2] Includes areas designated wilderness, wildlife, recreation, nature study, and research and experimentation.

[3] Includes commercial, industrial, institutional, transmission, waste disposal, military, and transportation uses.

Source: 1982 National Resources Inventory, USDA Soil Conservation Service.

Soil Conservation Service technicians conducting the 1982 NRI rated inventoried land on its potential for conversion to cropland and the type of effort required for conversion, and listed reasons preventing conversion (54). Of 70.7 million acres of non-Federal palustrine wetlands, only 5.1 million acres were rated as having high or medium potential for conversion to cropland in 1982 (table 7). A quarter of all palustrine wetlands were either already cropland or in an irreversible use. Another quarter were rated as having no potential for conversion, and 40 percent were considered unlikely to be converted soon.

Almost 85 percent of high- and medium-potential palustrine wetlands (4.3 million acres) could be brought into crop production with no effort or with minor work on the farm. Slightly more than 3 million of the 4.3 million acres would require drainage. Some 470,000 wetland acres have other soil conditions, such as low fertility, high erosion potential, alkalinity or salinity, or restrictive root zones, in addition to wetness, that restrict their conversion potential.

Many areas that had large losses of wetlands due to agricultural conversion between the mid-1950's and

Table 6—Non-Federal wetlands cross-classified by system and type, 1982

Wetland system[1]	Wetland type[2] Not typed	Inland Fresh 1-2	 3-8	 Saline 9-10	Coastal Fresh 12-14	 Saline 15-20	Total
	Million acres						
Palustrine	2.0	31.4	35.7	1.2	0.2	0.2	70.7
Lacustrine	*	.2	.6	.6	*	*	1.5
Riverine	.1	.1	*	0	0	*	.1
Estuarine	.1	*	.1	.1	1.3	4.4	6.0
Marine	*	*	0	0	0	*	*
Total non-Federal[3]	2.2	31.7	35.7	1.9	1.6	4.6	78.4

* = Fewer than 100,000 acres.

[1] Defined in (8).

[2] Defined in (38).

[3] Detail may not add to totals due to rounding.

Source: 1982 National Resources Inventory, USDA Soil Conservation Service.

mid-1970's had relatively little remaining wetlands with high or medium cropland potential in 1982 (fig. 4). Louisiana and Arkansas had only 144,000 and 121,000 acres of potentially convertible bottomlands, a fraction of the 1.7 million acres each lost earlier. There are similar but less dramatic differences between wetlands lost to agriculture and remaining wetlands with cropland potential in Mississippi and North Carolina. Both Florida and Minnesota had relatively high wetland losses through the 1970's and still have more than 500,000 wetland acres with high and medium cropland potential. Both Alabama and North Dakota had small or no net losses of wetlands in the earlier period and had 401,000 and 298,000 acres of high and medium potential wetlands remaining in 1982.

Table 7—Conversion potential and effort required to convert non-Federal palustrine wetlands, 1982

Conversion potential	Effort required: None	On-farm	Multifarm or project[1]	Not applicable	Total
	Million acres				
High or medium	0.5	3.8	0.7	*	5.1
Reason preventing conversion—					
None	.1	.4	*	*	.6
Too wet	.3	3.0	.7	*	4.0
Soil condition	*	.4	*	0	.5
Unlikely	.8	16.0	9.4	1.9	28.0
Zero	.3	4.3	4.8	8.9	18.3
Other	0	0	0	19.2	19.2
Total non-Federal[2]	1.6	24.1	14.9	30.0	70.7

* = Fewer than 100,000 acres.

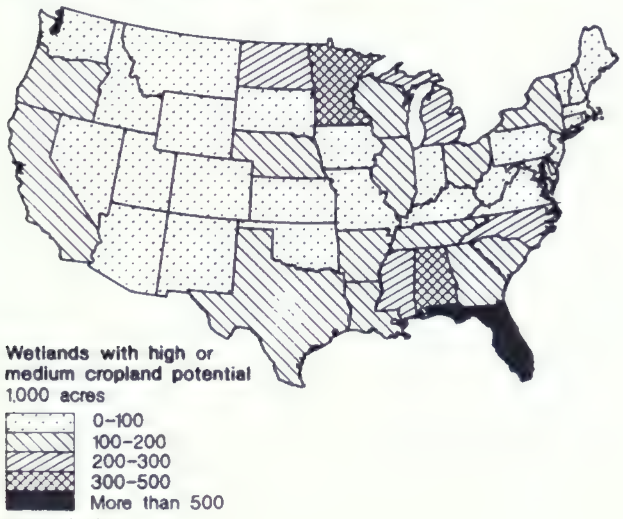
[1] Conversion requires action by several farms or a special district.

[2] Detail may not add to totals due to rounding.

Source: 1982 National Resources Inventory, USDA Soil Conservation Service.

Figure 4

Remaining wetlands with high or medium cropland potential, 1982



Source: (*54*)

Economics of Wetland Conversion for Agriculture

Agricultural conversion of wetlands is analyzed in two ways in this report. First, estimated crop yields on remaining private palustrine wetlands are linked with variable costs of crop production to estimate commodity prices at which the farm operator would just break even. Any wetland acre for which the break-even price is smaller than the current commodity price is a candidate for conversion, since it is potentially profitable to bring into crop production. In the long run, revenue from crop production must be high enough to cover the cost of converting the wetland, as well as other usual fixed costs. Even if current prices are low, conversion may take place if higher prices are expected. Conversely, high prices in a single year may not induce conversion if prices are expected to drop.

Second, hypothetical farm operations engaged in wetland conversion are analyzed to show the impact of swampbuster sanctions. The effects of both price-support and income-tax subsidies are examined. A description of the role that price-support programs and income tax provisions play in wetland conversion for agriculture precedes the analyses.

Farm Programs, Income Taxes, and Wetland Conversion

Farm programs influence farmers' decisions to plant by supporting prices and raising revenues, or by subsidizing costs of production. Crop insurance and disaster payments influence farmers' decisions by reducing risk, which may raise expected revenues if the premium subsidy is sufficiently large. Farm price supports can make the difference between profitable or unprofitable operation to the extent that wetland areas developed for crop production are economically marginal. If converted wetlands are riskier to farm than other land that could be converted to cropland, crop insurance and disaster payments can reduce differences in the expected returns of these alternatives. The higher cost of developing wetlands can be subsidized through reduced-rate loans. Program effects analyzed here are limited to deficiency payments, except for soybeans, which have only a loan rate; operating loan subsidies, crop insurance, and disaster payments were not analyzed (but see box).

Denying farm program benefits to operators converting wetlands would not be effective when market prices are high. Farm program benefits are more important to operators when commodity prices are low. Only 23 percent of total cropland was enrolled in farm programs in 1982, before commodity prices dropped, but 56 percent of cropland was enrolled in 1984 (*47*).

Farm programs may not be important to many of the farmers who could convert wetlands. Only 27 percent of eligible farms enrolled in the programs in 1984. Participation varies by crop, ranging from a low of 14.5 percent of eligible oat acreage to 87.5 percent of eligible rice acreage. Wheat and corn accounted for more than 75 percent of enrolled acreage. The extent of farm program participation by operators who have converted wetlands in the past, or who currently own wetlands that could be converted, is not known. Soybeans, one of the major crops for which wetlands have been converted, have no deficiency payment program, and recent loan rates have been well below market prices.

Other Farm Programs

Several farm programs do not directly support prices, but reduce costs or risks of crop production. Among these programs are subsidized interest rates on loans from the Farmers Home Administration (FmHA), crop insurance under the Federal Crop Insurance Corporation or its reinsurance programs, and Agricultural Stabilization and Conservation Service disaster payments.

Subsidized interest rates for FmHA operating loans in 1982 were 2.4 percentage points lower than unsubsidized rates, resulting in operating loan subsidies ranging from $0.16 to $3.57 per acre, depending on differences in operating capital between crops and regions. Farm ownership and storage facility loans, when available, affect the entire farm operation and cannot readily be identified with newly converted cropland. Likewise, emergency loans, available only in designated disaster areas, cannot be directly associated with new cropland.

Although crop insurance is gradually replacing disaster payments, substantial payments were still being made in recent years. Disaster payments for cotton were as high as $16 per acre in Georgia and were $11 per acre in Texas (*29*). These programs reduce risks associated with crop production, thereby raising the expected revenue from farming and providing an incentive to bring land into production.

It is not just farm program benefits, but also Federal income tax treatment of land development, that subsidize clearing and draining land for agriculture (see box). Other researchers have analyzed tax subsidies for farmland development. Analysis of restrictions on use of cropland deductions in the Internal Revenue Code shows that benefits are disproportionately available to larger operators (*39*). Thus, profitable farms, with sufficient net farm income to write off the maximum land-clearing expense and to deduct soil and water conservation expenses in fewer years, have greater incentives to convert land.

Watts, Bender, and Johnson (*56*) calculated the value of tax incentives for converting rangeland to cropland in Montana. They estimated that capital gains treatment and investment tax credits reduced the break-even resale price of plowed rangeland $27 to $85 per acre from the break-even price without such tax treatment. At low tax rates, investment credits were more valuable incentives than capital gains provisions, but at high tax rates capital gains treatment was worth three times as much as the investment credit.

Leitch and Kerestes (*21*) studied land drainage costs and after-tax returns in Minnesota. Assuming a 40-percent tax bracket, tax savings on ditch drainage were estimated at $57 per acre, while credits and depreciation on tile drainage saved between $68 and $93 per acre. These tax savings amounted to 18 percent for tile drainage and 40 percent for ditch drainage. The effect of capital gains was not estimated, and the tile was depreciated using straight-line methods over 8 years rather than accelerated cost recovery in 5 years; therefore, estimated tax incentives are probably low.

Barrows, Henneberry, and Schwartz (*5*) simulated wetland conversions for representative dairy and vegetable farms in southeastern Wisconsin. The 1981 tax returns for families with farm incomes of $6,000, $12,000, and $20,000 were calculated for least favorable, most favorable, and average conditions for drainage. Calculating after-tax net income for the first 3 years of the drainage investment, they showed that tax subsidies rise with increasing income, ranging from zero for the $6,000-income farmer to $23 per acre for the $20,000-income farmer. Tax incentives for drainage increased net income for unfavorable and average conditions more than for favorable situations, since higher taxes on incremental income from draining good land overshadowed benefits of the special provisions applying to wetland drainage. Capital gains were not considered and no attempt was made to compute net present values of tax incentives; only year-by-year changes in tax liabilities were calculated.

Shabman (36) estimated tax savings of about 30 percent on conversion of Mississippi bottomland hardwoods. Reductions of 44 percent in annual cash flow requirements were estimated for a hypothetical operator in the 30-percent tax bracket. Since these calculations were based on tax law before the Tax Reform Act of 1981, they are probably conservative compared to treatment of property now handled under the accelerated cost recovery system.

According to an Internal Revenue Service (IRS) sample of 1982 returns, 2.5 percent of Schedule F filers claimed land clearing deductions averaging $1,060, and 3.9 percent claimed soil and water conservation expenses averaging $1,065. It is not known how much of these amounts were for clearing and draining wetlands. More than half (53.5 percent) of the deductions were claimed by low-tax-bracket operators with less than $11,900 of taxable income. Only 5.1 percent of the deductions were claimed by operators with more than $500,000 of farm business receipts. Even less is known of nonfarm taxpayers who might become involved in wetland conversion for farming. In 1982 about one-third of total deductions for land clearing and for soil and water conservation was claimed by Schedule F filers with more than $50,000 of off-farm income.

Tax reform may eliminate some tax breaks for land conversion. A tax reform bill passed by the House Ways and Means Committee in late 1985 repealed deductions for land clearing expenditures, tightened eligibility for soil and water conservation deductions, and denied exclusion of capital gains from sales of converted wetland (6). However, these changes may not be included in final tax reform legislation.

Conversion Potential of Private Palustrine Wetlands

We derived estimated crop yields on privately owned palustrine wetlands identified in the 1982 NRI by linking Soil Conservation Service (SCS) soil interpretations with the NRI wetland points (49). SCS collects and analyzes data from research plots, field trials, and farmer's fields for use in soil interpretations. Estimated yields are established for benchmark soils based on review of yield data from all available sources, and are reviewed by all States in which the soil occurs. SCS records predicted crop yields approximating those obtained by

Income Taxes and Agricultural Land Use

Farmers who convert land for farming can reduce their income tax liability through deductions, credits, and capital gains. Some of these are limited to maximum amounts or percentages of income and also are subject to other restrictions. Specific provisions are:

- Deduction of land clearing costs up to $5,000 or 25 percent of net farm income (Section 182 of the Internal Revenue Code);
- Deduction of drainage and land shaping, construed as soil and water conservation activities, up to 25 percent of gross farm income, with amounts that exceed this limit in 1 year carried forward (Section 175);
- Deduction of depreciation under the accelerated cost recovery system (Section 168);
- Deduction of interest payments on debt financing of clearing and drainage (Section 163);
- Investment tax credit equal to 10 percent of depreciable investments associated with clearing and drainage (Section 46);
- Exclusion of 60 percent of long-term capital gains from sale of improved farmland (Section 1202).

Deductions for land clearing and for soil and water conservation reduce taxes in the current year in lieu of capitalizing those expenses, which would increase the taxable basis of the improved land. This deduction also has the effect of increasing the amount of long-term capital gain that will be realized on sale of the property; long-term capital gains are taxed at a lower rate than ordinary income. Land clearing deductions cannot be claimed after the land is in production, and soil and water conservation deductions cannot be claimed for land that is not used for farming. In fact, the interpretation of these deductions is sufficiently broad that almost any activity that involves clearing vegetation, moving earth, or ditching can qualify for either one or the other section (55, Chapter 6).

The investment tax credit effectively reduces the cost of qualifying investments by one-tenth, if tax liabilities are higher than the credit allowed. Accelerated cost recovery allows the investment to be written off faster, increasing after-tax income in earlier years over true economic depreciation. Deducting interest effectively reduces the cost of financing land conversion investments by a percentage equal to the marginal tax rate, which can be as high as 50 percent.

leading commercial farmers at the level of management that tends to produce the highest economic returns per acre. This level of management involves using the best varieties; balancing plant populations and fertilizers to the potential of the soil; controlling erosion, weeds, insects, and diseases; and maintaining optimum soil tilth and adequate drainage (49). Some soils have no estimated yields, or no yields estimated for certain crops, because crop production was not judged feasible on these soils given existing technology and economics. Costs of production by crop and by State are estimated in crop budgets developed by Economic Research Service (ERS) as part of the firm enterprise data system (FEDS). FEDS budgets are based on data from periodic farm production expenditure surveys and are processed using a version of the Oklahoma State University budget generator (*20*). Variable costs include annual costs of seed, fertilizer, and chemicals, interest on operating capital, and costs of machinery fuel, repairs, and labor needed to plant and harvest a crop. They exclude fixed costs such as capital replacement, taxes, interest, and insurance on machinery and buildings, land charges, and general farm overhead. Budgets for nonirrigated and irrigated production of eight farm program crops (corn, soybeans, wheat, cotton, oats, barley, sorghum, and rice) at the technology and price levels of 1982 are used in this analysis.

We divided variable production costs by estimated yields to get the cost per unit of production. This cost represents the minimum price at which producing the particular crop just covers variable costs of the enterprise in the short run. Our analysis was limited to privately owned palustrine wetlands since these are the principal remaining wetlands vulnerable to farm conversion.

Program Crops and Prices. It is difficult to predict what prices farm operators with wetlands that might be cropped will face. Depending on loan rates in effect, commodity loan programs administered by the Commodity Credit Corporation (CCC) can establish a floor price well above market clearing levels. Under the Food Security Act of 1985, loan rates are 75-85 percent of average market prices over the previous 5 years (discarding high and low years) and deficiency payments will be used to supplement farm income (*40*). This should result in: (a) lower season-average prices than those received under the 1981 price-support programs, but (b) target prices nearly equal to earlier levels, at least in the first years of the program.

This analysis assumes that farmers contemplating conversion of wetlands would base their decision on an expected price that weighted near-term price projections higher than prices projected for the more distant future. A simple sum-of-years digits weighting scheme was used to calculate an expected price for the 1986-91 period (table 8).

Of 59.9 million acres of private palustrine wetlands inventoried in 1982, about 72 percent are suited to at least one of the eight farm program crops. SCS has estimated yields on 42.9 million acres (table 9). Accumulating the acres of private palustrine wetlands at each break-even unit cost of production for each crop and arraying them in ascending order results in supply curves for wetland conversion, such as the one for soybeans shown in figure 5. This curve shows, for example, that almost all 24 million acres with potential for soybean production would cover variable costs at a soybean price higher than $4 per bushel. Soybeans have the greatest potential for production on private palustrine wetlands, followed by corn, oats, and wheat.

Table 8—Historical and expected prices for farm program crops

Crop	Season average market prices[1]					Expected prices 1986-91[2]	
	1980	1981	1982	1983	1984	Market	Target
	Dollars per unit						
Soybeans	7.57	6.04	5.69	7.81	6.13	5.21	4.65[3]
Corn	3.11	2.50	2.68	3.25	2.69	1.84	2.95
Oats	1.79	1.89	1.49	1.67	1.72	.93	1.56
Wheat	3.91	3.66	3.55	3.53	3.37	2.33	4.27
Cotton	.75	.54	.59	.66	.59	.47	.78
Barley	2.84	2.44	2.22	2.50	2.26	1.57	2.54
Sorghum	2.94	2.38	2.52	2.84	2.37	1.69	2.81
Rice	5.76	4.07	3.65	3.94	3.65	2.04	5.03

[1] *Agricultural Statistics, 1985.* [2] Weighted averages of market and target prices implied by 1985 legislation using year number divided by sum of the years (for example, 6/21 for first year, 5/21 for second year). [3] Expected loan price for soybeans.

At 1982 season-average prices, almost all private palustrine wetlands for which estimated yields are available would have returned sufficient revenue to cover variable costs of production. About 4.4 million acres of these wetlands were used as cropland in 1982, while retaining their status as palustrine wetlands. Thus, 38 million acres could have been converted to cropland, depending on clearing and drainage costs and the availability of equally or more attractive potential cropland from nonwetland sources. This estimate is far larger than the 5.1 million acres of high- and medium-potential cropland inventoried by SCS and reported in table 6. However, the difference is not surprising since field assessments of cropland potential included information on size, accessibility, and ownership factors affecting conversion as well as drainage feasibility and expected yield. The effect of regulatory programs administered by State and Federal agencies can also reduce the economic feasibility of some wetland conversions. Some 21.6 million acres of wetlands in unfavorable land capability classes[2] VII and VIII were not rated for conversion potential, although more than 2.8 million acres of existing cropland are in these classes, and drainage would undoubtedly improve this land's agricultural capability. Also, lower assessments of wetland crop potential may, consciously or unconsciously, reflect USDA's policy restricting financial and technical assistance for drainage to palustrine wetlands in types 1 and 2.

At expected season-average prices, returns would cover variable costs of production for acreages of each of the eight crops shown in the second column of table 9. If all producers were to receive deficiency payments, from 25 to 115 percent more acreage would have returns exceeding variable costs. The exception is soybeans, for which deficiency payments are not available. Since the expected loan price of $4.65 per bushel is lower than the expected season-average price, slightly fewer acres of soybeans could earn shortrun returns above variable costs at the loan price. Corn and oats would have the largest increases in acreage under price supports compared with season-average prices. For corn, the 7.2 million-acre increase is 62 percent of corn acreage that would earn shortrun returns above variable costs without price supports.

Table 9—Remaining private palustrine wetlands feasible for production of program crops under expected prices, 1986-91

Crop	1982 wetlands with estimated yields	Positive returns to variable costs at 1986-91 expected prices	
		Season-average	Target/loan
		Million acres	
Soybeans	24.0	24.0	23.8
Corn	19.5	11.6	18.8
Oats	13.0	7.1	12.8
Wheat	6.5	4.5	6.4
Cotton	4.3	2.0	4.3
Barley	3.7	2.3	3.5
Sorghum	3.1	2.6	3.0
Rice	.5	.4	.5
With yields[1]	42.9	na	na
Remaining wetlands	59.9	na	na

na = Not available since some acres have estimated yields for more than one crop. [1]Detail does not add to total because some acres have estimated yields for more than one crop.

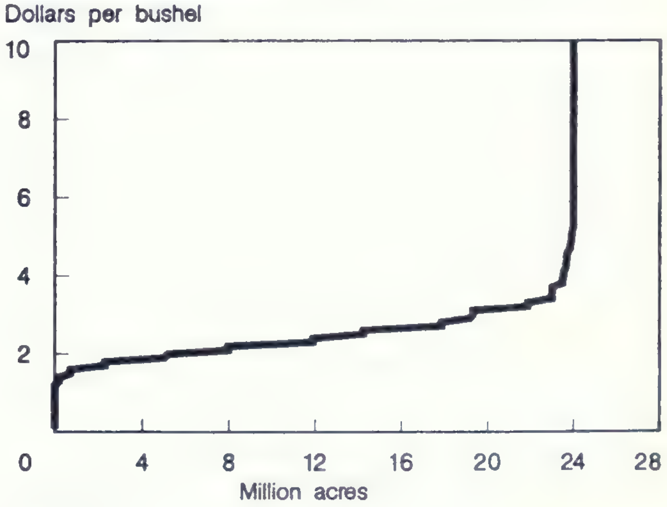
Source: 1982 National Resources Inventory, USDA Soil Conservation Service.

Price supports provide an incentive to bring wetlands into production. Feasible acreage without price supports ranges from 46 to 80 percent of acreage that could earn shortrun profits without price supports. However, the costs of conversion and the fixed costs which must be covered for longrun profitability are ignored. The additional revenue provided by deficiency payments is not likely to be sufficient to offset these costs. For soybeans, probably the most important crop produced on converted wetlands, price supports under CCC loan operations are not likely to rise above market prices, providing no incentive for wetland conversion beyond their role in reducing producer risk.

Conversion Costs. The preceding analysis is both short run and applies at the margin. That is, we made no attempt to take account of the costs of

Figure 5

Supply response curve on wetlands for soybeans, 1982



Source: (*54*).

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[2]The land capability class system rates land's suitability for agricultural production.

converting the wetland, or the costs of starting a farm by converting large tracts of wetland as the principal cropland in the enterprise. These factors are less important in an area such as the prairie pothole region, where isolated wetlands surrounded by existing cropland are relatively inexpensive to convert. Where large tracts are converted or where the costs of conversion are high, the short-term economic feasibility of cropping the marginal wetland acre matters less than the costs of conversion.

High costs of converting land to crop production are probably the principal barrier to conversion of most remaining wetlands. In a Minnesota survey of potential cropland owners, high cost was the most important obstacle to conversion listed by respondents (*34*). Conversion costs affect the financial feasibility of wetland conversion because they can be relatively large and are incurred at the beginning of land development, before offsetting revenues begin. Such costs are large enough to affect the economic feasibility of conversion if the sum of after-tax annualized conversion cost and acquisition cost exceeds the margin between variable production costs and gross revenues from crops (*34*).

Despite the importance of conversion costs, relatively little systematic information exists on a nationwide basis. The 1983 farm production expenditure survey (FPES) gathered data on new construction expenses for land clearing, surface and subsurface drainage, leveling, and other land improvements from a national sample of farm operators (*10*). Clearing expenses averaged $80 per acre, ranging from $42 in the Southern Plains to $267 in the Northeast. Drainage expenditures averaged $101 per acre, ranging from $21 in the Delta to $295 in the Southeast. However, since it is not possible to separate wetland conversions from clearing and drainage on nonwetland, these data probably understate the costs of clearing and draining wetlands. Follow-on surveys to the 1978 USDA landownership survey gathered data on clearing and drainage investments undertaken between 1975 and 1977 (*23, 24*). Average clearing and drainage costs were $175 and $95 per acre, respectively, but these suffer from the same flaw as the FPES data.

Economic studies of wetland conversion in several farming areas where loss of wetlands has been a concern are summarized in table 10. These studies are useful chiefly for revealing the wide variation in activities necessary to convert wetlands in different areas, resulting in widely varying conversion costs. Conversion of pocosin wetlands in North Carolina requires constructing drainage canals and pumping stations for outlets, as well as V-ditches to drain the fields. Clearing the forest and scrub vegetation requires heavy bulldozing, and removing roots and fallen logs takes several passes with custom-built root rakes. Newly cleared and drained pocosin land is organic and acid, requiring heavy liming and fertilizing to balance pH and restore trace minerals, and must be worked to condition the soil. Such conversions cost $1,000 to $1,500 per acre, even for large operations that can fully realize economies of scale.

In contrast, converting prairie pothole wetlands usually requires only drainage ditches. Costs are estimated at only $150 to $800 per acre, and can be as low as $14 per acre where operators do most of the work with their own machinery (*22*). Conversion of bottomland hardwood swamps in the Lower Mississippi superficially resembles conversion in the North Carolina pocosins. However, drainage outlets usually have been provided by public investment in channelization and flood-control projects, eliminating the largest part of drainage expense (*44*). Clearing and root removal operations are either not as extensive or not done to the degree seen in North Carolina, resulting in lower land development costs. Soil amendment, apart from ordinary fertilization and liming included in crop production costs, is apparently not required (*18*). Consequently, conversion costs in this area are only $150 to $225 per acre, about 10 to 20 percent as high as in North Carolina and less expensive than some drainage in the prairie pothole area.

Converting land for crop production in the Rainwater basin and Sandhill areas of Nebraska is primarily a byproduct of irrigation development, which incidentally drains wetlands into reuse pits or lowers groundwater levels through pumping (*15*). Constructing reuse pits or dugouts and leveling for center pivot irrigation systems costs between $120 and $600 per acre, but no clearing or other expenses are incurred.

Amortized over 20 years at 10-percent interest, these conversion investments imply annual costs ranging from less than $20 per acre for ditch drainage of prairie pothole wetlands to $170 per acre for complete conversion of North Carolina pocosins (table 10). As a percentage of variable production costs, these annualized costs range from 75 to 186 percent of corn and soybean costs in North Carolina; from 15 to 150 percent of corn, soybean, and wheat costs in Minnesota; from 25 to 35 percent of soybean and wheat costs in Arkansas; and from 6 to 69 percent of irrigated corn and soybean production costs in Nebraska. Thus, fixed costs due to conversion can be relatively unimportant, adding only 6 percent to irrigated corn production costs in Nebraska, or overwhelming, almost tripling production costs for soybeans in North Carolina. Where conversion costs are high, the relatively small impact of farm programs on revenues is probably less important to the conversion decision than in situations where conversions costs are small. Therefore, denying benefits may be more effective on wetlands that are easy to convert to cropland.

Economics of Conversion for Hypothetical Farms

The impact of swampbuster sanctions does not hinge on the economic feasibility of converting wetlands with or without price supports for crops grown on the converted wetlands. An operator who plants any annual crop on converted wetlands loses eligibility for farm program benefits on all crops grown in the entire operation. The cost to the operator of the swampbuster sanction thus depends on the amount of program benefits received on the initial acreage operated, not the benefits that might have been received for crops grown on the wetland portion.

An analysis of hypothetical farms from areas where wetland has been converted can show the importance of loss of benefits as well as tax subsidies. Tradeoffs between expanded production without benefits and foregone expansion with continued

Table 10—Costs of converting wetlands to cropland, by region

Description and source	Nominal cost		Cost index[1]	Current cost	
	Total	Annual		Total	Annual
	Nominal dollars			*Current dollars*	
North Carolina:					
Tile, heavy (3)	239.63	28.15	20.2	1,186.29	139.34
Tile, light (3)	136.63	16.05	20.2	676.39	79.45
Ditch, heavy (3)	187.89	22.07	17.9	1,049.66	123.29
Ditch, light (3)	84.89	9.97	17.9	474.25	55.70
Small operator (10)	1,076.53	126.45	86.5	1,244.54	146.18
Large operator (10)	1,450.00	170.32	86.5	1,676.30	196.90
South, forest (35)	900.00	105.71	86.5	1,040.46	122.21
Average	582.22	68.39	N/A	1,049.70	123.30
Standard deviation	509.50	59.85	N/A	362.50	42.58
Prairie pothole region:					
Ditch (21)	279.00	32.77	86.5	322.54	37.89
Tile (21)	781.00	91.74	87.4	893.59	104.96
Low (5)	153.61	18.04	66.1	232.40	27.30
High (5)	189.92	22.31	68.8	276.04	32.42
Low (5)	156.48	18.38	99.8	156.80	18.42
High (5)	186.34	21.89	99.5	187.28	22.00
Midwest, range (35)	250.00	29.36	87.4	286.04	33.60
Northern plains (10)	105.00	12.33	96.8	108.47	12.74
Average	262.67	30.85	N/A	307.90	36.17
Standard deviation	202.56	23.79	N/A	231.19	27.16
Lower Mississippi:					
Arkansas (44)	89.00	10.45	20.8	427.88	50.26
Louisiana (44)	69.00	8.10	20.8	331.73	38.96
Mississippi (44)	94.00	11.04	20.8	451.92	53.08
Woodland (18)	226.50	26.60	54.4	416.36	48.91
Woodland (18)	224.58	26.38	54.4	412.83	48.49
Woodland (18)	228.00	26.78	54.4	419.12	49.23
Delta, woodland (10)	163.00	19.15	95.8	170.15	19.99
Average	156.30	18.36	N/A	375.71	44.13
Standard deviation	66.34	7.79	N/A	90.74	10.66
Nebraska Sandhills:					
Reuse pit (15)	637.06	74.83	87.4	728.90	85.62
Leveling (15)	159.21	18.70	87.4	182.16	21.40
Center pivot (15)	115.38	13.55	87.4	132.82	15.51
Average	303.88	35.69	N/A	347.69	40.84
Standard deviation	236.27	27.75	N/A	270.33	31.75

N/A = Not applicable.

[1] Based on 1982 baseline of 100.

benefits and tax subsidies can also be analyzed. Two extremes are analyzed: a large-scale, expensive conversion of pocosin wetlands in North Carolina and a small, inexpensive conversion of prairie pothole wetlands in North Dakota.

Converting Pocosin Wetlands in North Carolina. Wetland conversion in this area is typified by large operations developed through previous wetland conversion (7). Expansion is continuing, with conversion in half-section or whole-section blocks involving costly excavation for V-ditches and canals and expensive pumping stations to remove drainage water. Much of the conversion has been done by corporate subsidiaries of large, nonfarm corporations or foreign consortiums (32). Farm program participation in this area is low, with only 7.5 percent of North Carolina corn farmers and 20 percent of corn acreage base enrolled in 1984.

The farm analyzed here assumes a 1,000-acre cash grain operation growing corn and a soybean-wheat double-crop rotation. An individual tax return with substantial off-farm income ($100,000) is assumed. Revenue from the rotation, including deficiency payments, is $410 per acre; variable and fixed costs of production total $288 per acre.

A 320-acre wetland conversion is planned, with conversion costs of $1,979 per acre, partly financed out of nonfarm income, and production costs similar to those for existing cropland. Revenues on the newly drained land are $234 per acre in the first year of production and approach revenues from existing acreage in the third year as drainage becomes fully effective. The conversion is assumed sold after 10 years, so that capital gains from appreciation are included in the analysis. Details are presented in appendix 2.

Prospects for the conversion are considered in terms of the present value of projected revenue, cost, and taxes over the 10-year planning period, discounted at an assumed 5-percent real interest rate. Three situations are shown in table 11: the current situation without the conversion but with deficiency payments; with the conversion and deficiency payments; and with the conversion but with price supports denied to the whole operation under swampbuster sanctions.

Converting an additional 320 acres of wetland with deficiency payments increases the present value of farm cash income by 5.5 percent. Taxable net farm income drops because conversion costs are written off as land clearing and soil and water conservation investments, and because of interest on debt incurred to undertake the conversion. Therefore, adjusted gross taxable income drops by 35 percent and taxes decrease by the same percentage.

After-tax income is the sum of farm and nonfarm cash income, less taxes paid, and capital gains realized from sale of the conversion, less any debt remaining from the investment. After-tax income with the conversion and with deficiency payments is just equal to after-tax income before conversion if the 320 converted acres can be sold for $2,315 per acre at the end of 10 years.

The cost of swampbuster sanctions against wetland conversion can be estimated by comparing (a) the present value of the operation (with the conversion) with deficiency payments and (b) the value of the

Table 11—Discounted present value of wetland conversion with and without deficiency payments, North Carolina pocosins[1]

Item	Before conversion, with payments	After conversion, with payments	After conversion, without payments	Change	
				From conversion	From loss of payments
	1,000 dollars			*Percent*	
Farm receipts	2,963	3,668	3,556	23.8	–3.0
Farm expenses	2,158	2,819	3,084	30.6	9.4
Cash income	805	849	472	5.5	–44.4
Nonfarm income	831	831	831	0	0
Adjusted gross	1,386	895	520	–35.4	–41.9
Taxes owed	538	346	252	–35.7	–27.2
Capital gain	0	309	309	N/A	0
After-tax income[2]	1,097	1,097	814	0	–25.8

N/A = Not applicable.

[1] Conversion of 320 wetland acres on a 1,000 acre corn-soybean-wheat operation with deficiency payments, sold after 10 years and discounted at 5 percent real interest rate. See text and appendix 2.

[2] Farm cash income plus nonfarm income plus capital gains less taxes owed and debt service on the conversion.

operation without deficiency payments. Without deficiency payments, farm receipts drop 3 percent, partly due to loss of the maximum $50,000 in payments. This loss is partly offset by revenue from planting 10 percent of total corn acres and 20 percent of total wheat acres set aside as a requirement for receipt of deficiency payments. Farm expenses increase by the cost of this extra planting, resulting in a 44-percent drop in farm cash income. The present value of net farm income for tax purposes is negative, so adjusted gross income falls 42 percent and taxes are reduced 27 percent. Overall, the present value of after-tax income is 26 percent lower without deficiency payments. Thus, the net present cost of the swampbuster sanction is $884 per acre converted, an amount likely to outweigh increased net returns at any conceivable yield level. The operation would be subject to increased risk without price supports and crop insurance, and possibly higher finance costs without subsidized loans, but those program benefits are not quantified in the analysis.

With up to $100,000 in annual nonfarm income invested in the conversion, reduced income taxes are worth $600 in net present value per acre converted, about one-third of the cost of acquisition and conversion. Tax reductions may well play a decisive role in turning economically unjustifiable wetland conversions into financially feasible propositions. For example, on North Carolina's Albermarle-Pamlico peninsula, three corporate farms acquired more than 400,000 acres and have been developing cropland since the mid-1970's (7, 32). These large operations are corporate subsidiaries with substantial nonfarm income from transportion, insurance, and foreign sources, so tax sheltering may be their primary motivation. The fact that much of the converted acreage is leased or sold to smaller, noncorporate owners suggests that obtaining tax benefits from conversion, rather than income from farming, is their objective. Converted land is cash-leased for about $75 per acre or share-leased for fixed rates of 25 bushels of corn or 8 bushels of soybeans (equivalent to between $45 and $75 per acre). Capitalized at 10-percent interest, these lease rates imply land values of $450 to $750 per acre, less than half of the $1,579 acquisition and conversion cost. Hence, sheltering nonfarm income from taxes, with the expectation of long-term capital appreciation, can subsidize wetland conversions for large corporate landowners. They can then pass the operation of converted land on to tenants at rates that are economically feasible for farming.

Converting Prairie Pothole Wetlands in North Dakota. Wetland conversion in North Dakota is typified by small drainage projects to improve isolated, seasonally wet areas for more intensive crop use. Conversion costs are generally lower than for wooded wetlands such as the North Carolina pocosins, because the pothole area does not have to be cleared and requires less drainage. Farm program participation in this area is high, with 81 percent of wheat acreage base enrolled in 1984 by 73 percent of wheat farmers.

The farm analyzed here has 1,170 acres in wheat production, with variable and fixed production costs totaling $126.59 per acre. Wheat yields 35 bushels per acre when the area is drained. A 10-acre pothole area is drained at a cost of $187.20 per acre. To assess the effect of appreciation, we assume that the 10-acre conversion is sold after 10 years for $600 per acre. Details are shown in appendix 2.

The discounted present value of 10 years' gross farm receipts from sale of wheat, with set-asides under the farm program, is about $1.2 million, and the conversion adds only $17,102 (table 12). The present value of farm cash income is increased only $9,654 and capital gains from sale of the conversion are worth $3,508. The present value of after-tax income increases $8,515 or $851 per acre converted. All of the increase is from deficiency payments on the converted acres and the increase is somewhat offset by a tax increase of $2,865.

Deficiency payments for wheat have been higher than for other crops. The expected season-average price for wheat assumed in this analysis is $2.87 per bushel, while the target price is $4.38 per bushel. If eligibility for deficiency payments on the entire 1,180 acres were lost under the swampbuster provisions, the present value of gross farm receipts would fall $193,365, or 16 percent. Annual net farm income would become negative and the present value of adjusted taxable gross income would drop 150 percent. After-tax income would fall $374,655, a loss that amounts to a penalty of almost $37,500 per wetland acre converted.

Comparing these two analyses shows that swampbuster sanctions are likely to be more effective in the prairie pothole region than in the pocosin area for several reasons. First, the rate of farm program participation is higher on wheat farms in the prairie than on corn and soybean farms in eastern North Carolina. For program participants, deficiency payments on wheat farms are a larger percentage of net farm income than on corn and soybean farms. Wetlands in the prairie pothole area are small relative to total cropland acreage, so that income gains from conversion are dwarfed by potential loss of benefits on nonwetland cropland. Finally, opportunities to shelter nonfarm income through tax breaks for conversion costs are small in the prairie pothole area, compared with potential tax breaks from the high clearing and drainage costs in the pocosins.

Indirect Motivations for Conversion

Conversion of wetlands for farming can be expected if operators think conversion will be profitable. However, conversion to crop production can occur indirectly, even though it may not be profitable.

Forestry and agriculture are often linked in wetland conversion. Timber harvest of wooded swamps may be the primary reason for some wetland destruction, with agriculture a residual user of the newly cleared land. More than half of palustrine wetlands converted to agriculture between the 1950's and 1970's were forested, but there is no information on how much of these wet forests were directly cleared for agriculture and how much went into agriculture after these wetlands had been cleared for timber. About 60 percent (42.6 million acres) of palustrine wetlands were forested in 1982.

Other wetlands are converted to remove obstacles to large-scale agriculture. The prairie pothole wetlands of the Dakotas and Minnesota are the primary example of this kind of conversion. Here, the value of the converted wetland for crop production is less important than removing an obstacle to straight-row farming or center-pivot irrigation systems. Isolated wetlands within fields require more turns for machinery and form point rows and dead rows that cannot be planted or harvested; wetlands within fields also can restrict machinery choices to smaller, less economical sizes.

Many activities lower water tables, destroying wetlands and making agricultural conversion more attractive. Stream channelization for flood control, as occurred in the Central and Southern Florida Flood Control Project (42) and in the Lower Mississippi Alluvium (44), can increase flow rates and lead to lower water levels in nearby wetlands. Irrigation can lower water levels through pumping and through construction of dugouts as catchments for irrigation water.

These indirect modes of conversion will not be affected by swampbuster sanctions, since they may destroy wetlands well before the land is farmed.

Wetland Values Foregone From Conversion

A variety of private and public benefits are lost when wetlands are drained. These highly productive ecosystems are essential habitat for a variety of fish and wildlife species. They provide many ecological services and recreational opportunities, as well as producing renewable resources. For the most part, these benefits have not been measured in monetary terms because they are hard to estimate. Nevertheless, the values of wetlands are real and need to be recognized when conversion is possible. This section reviews values of wetlands and gives examples of monetary estimates.

Table 12—Discounted present value of wetland conversion with and without deficiency payments, North Dakota prairie potholes[1]

Item	Before conversion, with payments	After conversion, with payments	After conversion, without payments	Change: From conversion	Change: From loss of payments
	Dollars			*Percent*	
Farm receipts	1,196,300	1,213,402	1,020,037	1.4	−15.9
Farm expenses	984,212	991,660	1,211,363	.8	23.9
Cash income	212,088	221,742	−191,326	4.6	−186.3
Nonfarm income	83,064	83,064	83,064	0	0
Adjusted gross	266,079	274,848	−137,615	3.3	−150.1
Taxes owed	44,749	47,614	8,674	6.4	−81.8
Capital gain	0	3,508	2,982	N/A	−15.0
After-tax income[2]	250,403	258,918	−115,737	3.4	−144.7

N/A = Not applicable.

[1] Conversion of 10 wetland acres on a 1,170-acre wheat operation with deficiency payments, sold after 10 years and discounted at 5-percent real interest. See text and appendix 2.

[2] Farm cash income plus nonfarm income plus capital gains less taxes owed and remaining debt on the conversion.

Fish and Wildlife Values

Estuarine wetlands play an important role in the life cycle of many fish species. Approximately two-thirds of the major U.S. commercial fish species spawn in estuaries and salt marshes (*43*). Fifty-seven percent of the 10 most important recreational marine fish species landed in 1979 also depended on estuaries (*28*). Inland freshwater wetlands are critical feeding, spawning, and nursery areas for several freshwater fish species. For example, marshes along Lake Michigan are used as spawning grounds by northern pike, yellow perch, and carp. Warmwater bass species use the southern bottomland hardwood forests as nursery and feeding grounds (*43*).

The species most closely associated with wetlands are waterfowl. Waterfowl depend on wetlands in the north for breeding areas, with the prairie pothole region the most important breeding area in the lower 48 States. It has been estimated that 20 percent of the annual continental production of waterfowl occurs in wetlands in the lower 48 States (*38*). Wetlands of the Chesapeake Bay, the Gulf Coast, the Central Valley of California, and the Mississippi River are major wintering areas for waterfowl. Various wetlands are also used as stopovers on migration routes (*28*).

The 1985 census of duck populations indicates a potentially bleak future for waterfowl. The mallard population was at an all-time low of 5.5 million, a 47-percent decline from the first census figures in 1955. The sharpest decline occurred in the pintail population, which was down 69 percent from 1955. A variety of factors are blamed for these declines, including hunting pressure, disease, and biological stress. There is no debate, however, over the critical role of habitat loss, especially in the prairie pothole areas of Canada and the United States (*33*).

At least 50 fur-bearing and other game species, in addition to waterfowl species, depend on wetlands for food, cover, or water. Most fur bearers, such as muskrat, nutria, and mink, are wetland species. Hundreds of nongame species also depend on wetlands for feeding, breeding sites, and wintering sites. Herons, egrets, cranes, storks, and ibises are all wetland inhabitants. At least 35 endangered species in the United States are wetland species, mostly in California and the Southeast.

Only about 10 million acres of wetlands in the lower 48 States are protected through Federal ownership, easement, or lease. Four million of those acres are in the National Wildlife Refuge System (*28*).

Ecological Values

Wetlands perform a variety of ecological services. For example, wetlands store flood waters and retard flood peaks. The ability of a wetland to reduce flooding depends on the size, topography, and location of the wetland relative to downstream areas, as well as the magnitude of the flooding. Evidence indicates that wetlands are more effective than terrestrial environments for storing flood waters. Comparisons of watersheds with wetlands and watersheds where wetlands have been drained show that wetlands are important for delaying the simultaneous arrival of flood peaks from tributary streams to main stem channels (*1*).

Wetlands improve water quality by trapping suspended sediments and remove nutrients, pesticides, and other toxic substances. Nutrient removal can control eutrophication, the explosive growth and decay cycle of algae, in adjacent waterbodies. Because of these capabilities, freshwater wetlands have been used to treat sewage effluent in some urban areas. However, the ability to remove sediments and adsorbed substances depends on the density of vegetation in the wetland. Wetlands do have a limited capacity to absorb such substances, and can be overloaded (*43*).

Wetlands have also been credited with both groundwater recharge and discharge. Except in certain regions (for example, cypress swamps and prairie potholes), wetlands seem to have no inherent characteristics for better recharge. However, data suggest that wetlands are more important as water discharge areas, and some can augment low flows (*1*).

A variety of other services have been attributed to wetlands. Wetland vegetation controls shoreline erosion. This is particularly important along coasts, where erosion can destroy public and private property, clog navigable waters, and degrade fish and wildlife habitat. Wetland plants are also efficient converters of solar energy, and provide food for a variety of species. Finally, it has been postulated that wetlands moderate local temperatures, and maintain regional precipitation and global atmospheric stability (*1*).

Socioeconomic Values

In addition to the values described above, wetlands also yield other market and nonmarket benefits.

Marketable commodities other than fish, shellfish, and fur bearers include timber, grazing for livestock, cranberries, blueberries, wild rice, and peat. Besides their use for livestock grazing, wetlands can be used to grow hay for winter feed. However, the harvest of peat is not compatible with wetland preservation because it destroys the wetland.

Nonmarket values from wetlands are also numerous. Wetlands are popular sites for recreation activities such as birdwatching, water sports, hiking, picnicking, and photography. Wetland areas often have high aesthetic appeal. As scientific research areas, wetlands can be an important resource for learning about these unique ecosystems and their associated species. The diversity and uniqueness of some of these wetlands may make them important reservoirs of genetic diversity. Finally, wetlands have an option value for people who are willing to pay to preserve them for future use, and an existence value for people who are willing to pay simply for their continued presence.

Estimation of Economic Values

A number of studies have attempted to estimate the value of wetlands for various purposes. Although economic measurement techniques are well developed, a lack of data, as well as scanty information on the physical and ecological processes of wetlands, plague most studies. In a recent review of wetland valuation studies, Shabman and Batie (37) concluded that few studies have used conceptually valid techniques or considered key linkages between wetland services provided and the wetland area studied. Therefore, the values reported here should be considered indicators, not exact estimates.

Wetlands are a critical factor in commercial fisheries. For the 15 most important commercial species of fish and shellfish harvested in 1980, 61 percent of dockside value was attributed to estuarine-dependent species, for a total value of more than $1 billion (28). A 1973 study of Virginia wetlands estimated that the annual potential benefits of the State's tidal marshes for fish production were $108 per acre, while the potential value for aquaculture ranged from $350 to $900 per acre (4). The total harvest value of unfinished mammalian pelts in the 1979-80 season was $295 million; 32 percent of that value was from mink, muskrat, and nutria, three wetland species. In Louisiana, 16,000 alligators were harvested in 1979 for a total value of approximately $1.7 million (28). Pelts and skins acquire further value as they are used to make retail products such as coats and shoes. A final renewable resource of wetlands is timber. The estimated standing value of southern wetland forests alone is $8 billion (43). The value of the timber on the 2,300-acre wetland ecosystem of Georgia's Alcovy River was estimated at more than $1.5 million, or $686 per acre (9).

Ecological values also have been estimated in several studies. The value of the Alcovy River ecosystem for sediment accretion was estimated at $3,000 per year, and for water quality improvement at $1 million per year. Virginia tidal marshes were estimated to have a value of $2,500 per acre for waste assimilation and $4,150 per acre for total life support, which encompasses a variety of ecological functions (4). The Army Corps of Engineers estimated the flood control benefits of the Charles River Basin wetlands at more than $1.2 million per year (9). Finally, Michigan's coastal marshes were estimated to have a value of $2,600 per acre for ecological functions (4).

The benefits of wetlands for fish and wildlife and recreation were also estimated in two of the above studies. In the Charles River Basin, recreation and fish and wildlife benefits from the wetlands were estimated to be $124,800 per year (9). The Michigan coastal marshes were estimated to provide $490 per acre in recreation benefits and commercial fishing and trapping (4).

Two additional studies focused on the value of wetlands for waterfowl. Hammack and Brown (16) combined a population dynamics model with a recreation valuation study of waterfowl hunters in the Pacific flyway. They estimated a marginal value of $3.10 to $3.29 per bagged waterfowl. Miller and Hay (26) studied the relationship between habitat availability, hunter success, and hunting participation in the Mississippi flyway. Using a consumer surplus value of $29 per day of waterfowl hunting, they estimated that the loss of 10 percent of waterfowl habitat in the flyway would result in an annual loss of recreation benefits of $17 million per year.

Swader and Pavelis (41) used the values from the two waterfowl studies to compare land values for agriculture to those for duck hunting. Using a 7.75-percent discount rate and a bag rate of 1.6 birds per acre, Hammack and Brown's marginal rate was translated into a capitalized land value of $220 per acre in 1984 dollars. The habitat value from Miller and Hay's study was capitalized into a

$160 land value. These waterfowl values were then compared with 1984 and 1985 land values of agricultural lands in 20 Mississippi Flyway counties that had been at least 75-percent drained. The net agricultural value (gross land value minus estimated conversion cost) averaged $628 per acre in 1984. The land value from waterfowl hunting ranged from 21 to 63 percent of the agricultural value, with an average of 30 percent. However, because of the decline in land values in 1985 the average increased to 43 percent for 1985, and ranged from 24 to 93 percent of agricultural value. This indicates that the value of wetlands for hunting can be competitive with agricultural values, particularly if the value for hunting increases over time.

Some values cited in this section are summarized in table 13 on a per acre basis to approximate annual income streams. The values are shown in 1984 dollars, ranging from $3.04 to $10,333 per acre. The highest values are for ecological functions. These values are among the most difficult to estimate, and must be viewed with caution.

Presenting these values on a per acre basis is artificial in the sense that the economic values of wetland are not divisible. For example, a 50-percent reduction in wetland area does not imply a simple 50-percent reduction in benefits. Wetlands must be treated as ecological units that have a minimum size below which they can no longer provide certain values. The estimation work done to date has provided valuable information about wetland values. However, these estimates are site-specific for the most part and not amenable to generalization. Further research on the role of wetlands throughout the country is needed for consistent estimation. If, in fact, these functions provide such large benefits there is a tremendous incentive to preserve wetland ecosystems.

Table 13—Estimated wetland values per acre, from recent studies

Function	Site and source	Value per acre
		1984 dollars
Aquaculture	Virginia tidal marsh	872–2,241
Fish production	Virginia tidal marsh	269
Life-support	Virginia tidal marsh	10,333
Waste assimilation	Virginia tidal marsh	6,225
Sediment accretion	Alcovy River, Ga.	3
Timber production	Alcovy River, Ga.	1,605
Water quality enhancement	Alcovy River, Ga.	1,108
Ecological functions	Michigan coastal marshes	4,472
Fish and wildlife	Michigan coastal marshes	843
Flood control	Charles River, Mass.	362
Fish, wildlife, and recreation	Charles River, Mass.	38

Sources: (4, 9)

Critical Wildlife Wetland Areas

Tiner (43) identified nine wetland areas in the continental United States where wildlife are most threatened by conversion. They are: 1) estuarine wetlands of the coastal zone, 2) Louisiana's coastal marshes, 3) Chesapeake Bay's submerged aquatic beds, 4) South Florida's palustrine wetlands, 5) prairie pothole emergent wetlands, 6) Nebraska's Sandhills and Rainwater basin, 7) forested wetlands of the Lower Mississippi alluvial plain, 8) North Carolina's pocosins, and 9) western riparian wetlands. Agricultural conversion is considered a major threat to wetlands in six areas (4 through 9). Although conversion is not a primary threat in the other three areas, agricultural nonpoint pollution is damaging wetlands in those areas.

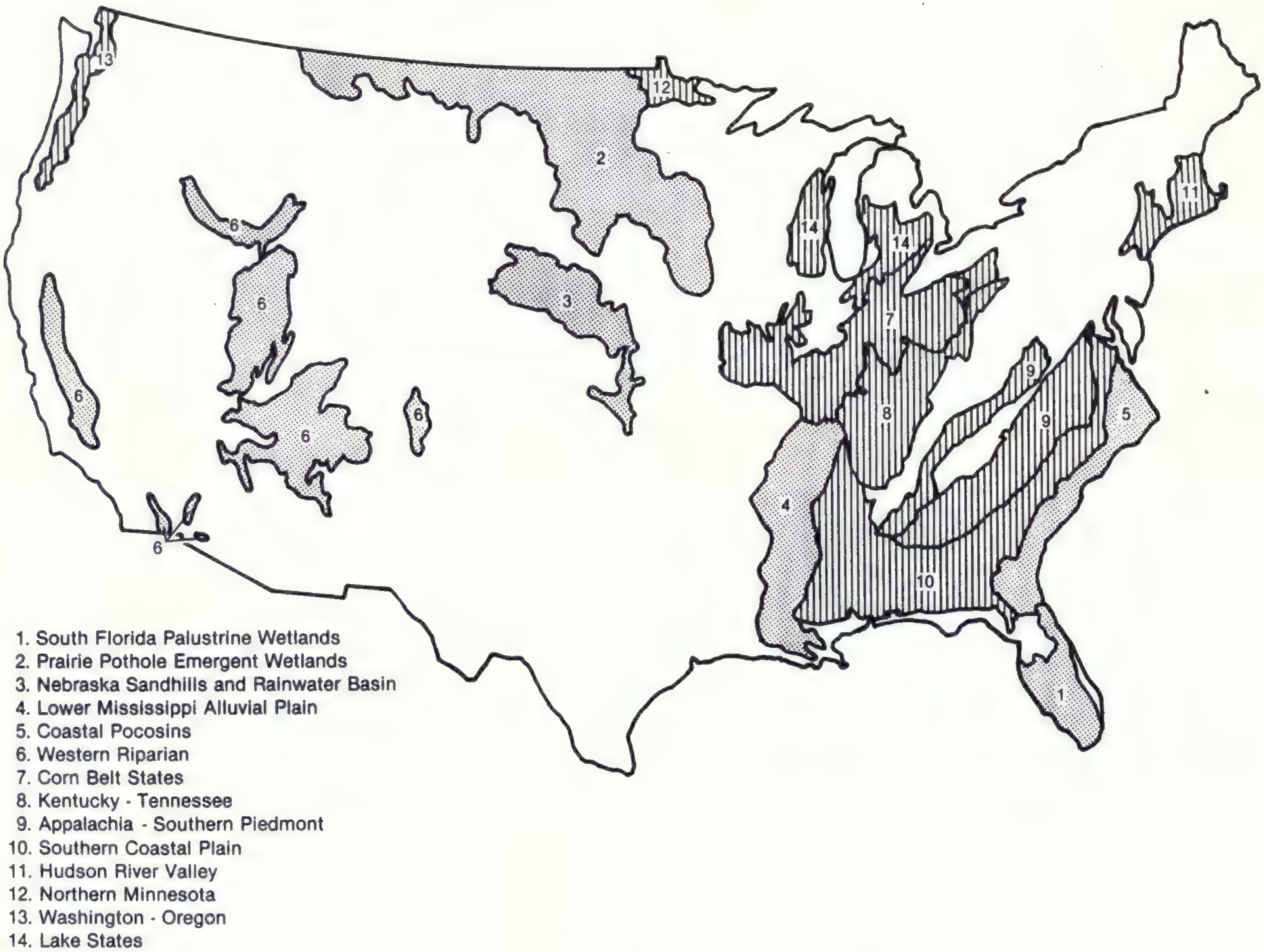
According to the 1982 NRI, 813,000 acres of non-Federal wetlands have a high potential for agricultural conversion, while another 4.4 million acres have medium potential. Using the 1982 NRI data, we matched Tiner's six problem areas as closely as possible with major land resource areas (MLRA's), in order to determine how much wetland with high and medium conversion potential fell into those six areas (fig. 6). In table 14, the six problem areas are listed with the number of acres in each that have high, medium, or unlikely potential as cropland. Thirty percent of all non-Federal wetlands fell into these six areas, including 37 percent of acres with high conversion potential and 34 percent with medium conversion potential. Hence, wetlands with high and medium potential for cropland are not concentrated in these six areas. Other wetland areas may have higher concentrations of high and medium potential cropland and should be examined for threatened wetland values.

South Florida's Palustrine Wetlands

These wetlands cover a 9,000-square-mile area that includes the Everglades. Freshwater runoff from this area is essential to maintain the salinity balance of coastal estuaries, which support 85 percent of Florida's offshore fishery. Also, southern Florida is a breeding ground and a wintering

Figure 6

Location of Critical Wetland Areas



1. South Florida Palustrine Wetlands
2. Prairie Pothole Emergent Wetlands
3. Nebraska Sandhills and Rainwater Basin
4. Lower Mississippi Alluvial Plain
5. Coastal Pocosins
6. Western Riparian
7. Corn Belt States
8. Kentucky - Tennessee
9. Appalachia - Southern Piedmont
10. Southern Coastal Plain
11. Hudson River Valley
12. Northern Minnesota
13. Washington - Oregon
14. Lake States

ground for many species of birds, and provides habitat to several endangered species. Drainage of wetlands for farming and flood control were the major factors in past wetland conversions in the area. Extensive drainage created various ecological problems. Saltwater intrusion into public drinking water supplies is a constant threat. The hydrologic regime of the Everglades has been disrupted, which threatens the biological integrity of the Everglades National Park.

Colonial bird breeding populations have dropped precipitously and fish nursery grounds have been disrupted. Scientists have also suggested that draining wetlands for channelization of the Kissimmee River may have been responsible for a change in local rainfall, which has created droughts in recent years. These problems, combined with recognition of the natural values of the area, have led Florida to undertake restoration of the Kissimmee River and the Everglades to their natural state (43).

The total area in the two MLRA's used to approximate the south Florida area is almost 15 million acres, 1.5 million of which were cropped in 1982. The predominant land use was divided among pasture, range, and forest. A total of 4.5 million acres of wetlands were on non-Federal land in these two areas. Only 62,000 of the wetland acres had high conversion potential, while 321,000 had medium potential.

Prairie Pothole Emergent Wetlands

The prairie pothole region is North America's most valuable waterfowl breeding ground. This 227,000-square-mile area of Canada and the United States produces between one-half and two-thirds of the ducks raised in North America, even though it comprises only 10 percent of all available duck nesting habitat. About one-quarter of the area lies in North Dakota (2.7 million acres), South Dakota (1.3 million acres), and Minnesota (1.5 million acres) (27). It has been estimated that half of the original wetlands are gone, mostly to farmland. Most ducks now breed on farm fields, not in isolated wilderness areas. In drought years, waterfowl are severely affected. Breeding habitat is lost when wetlands dry out; further, farmers can cultivate wetlands and can plow closer to remaining wetlands, removing valuable cover that waterfowl use as cover from predators (33). As more wetlands are drained, waterfowl are forced onto fewer and fewer remaining areas, which may lead

Table 14—Conversion potential of wetlands in critical problem areas, 1982

Area	High	Medium	Unlikely	Other[1]	Total
			1,000 acres		
South Florida palustrine wetlands MLRA's 155,156a	62	321	1,566	1,455	4,470
Prairie pothole emergent wetlands MLRA's 52,53,55,56,102a,103	98	472	1,540	2,103	4,888
Nebraska Sandhills and Rainwater basin MLRA's 65,71,75	26	105	479	173	859
Lower Mississippi alluvial plain MLRA's 131,134	96	302	1,724	1,415	4,264
Coastal pocosins MLRA's 153a,153b	18	271	2,578	3,183	7,754
Western riparian MLRA's 11,17,28a,31,35,37,51	2	33	166	1,125	1,441
Total	302	1,504	8,053	9,454	23,676
Total non-Federal	813	4,371	28,467	25,986	78,384
			Percent		
Percent of non-Federal	37	34	28	36	30

[1] Includes wetland with no conversion potential and where conversion potential was not estimated.

to decreased reproduction and increased likelihood of disease (43). Although the Federal Government has an acquisition and easement program in the area, approximately 90 percent of the wetlands are privately owned (27).

There are 93 million acres in the 10 MLRA's used to approximate the pothole region, including North Dakota, South Dakota, Minnesota, and parts of Montana and Iowa. The predominant use was cropland, which covered 63 million acres. There were 4.9 million acres of non-Federal wetlands in the 10 areas. Only 62,000 acres had high potential for conversion, but 2.5 million acres had medium conversion potential.

Nebraska's Sandhills and Rainwater Basin

These two areas in Nebraska are a critical migratory stopover for waterfowl in the central flyway and for sandhill cranes. Eighty percent of the Nation's sandhill cranes use the Sandhill region of the Platte and North Platte Rivers during spring migration, and the endangered whooping crane also migrates through the area. The Rainwater basin is a spring stopping ground for approximately 2.5 million ducks and geese. Drainage for agricultural production, filling for pivot irrigation, and lowered groundwater levels from irrigation pumping all have affected wetlands in this area. Upstream diversions of the Platte River have changed the vegetation of the area and reduced the number of suitable roosting areas for sandhill cranes. The remaining roosting sites are more crowded, which increases the chance of disaster from weather or disease. There have already been outbreaks of avian cholera in the Rainwater basin area because of the waterfowl crowding on remaining wetlands (43). An estimated 1 million acres of wetland remain in the Sandhills, while only 14,000 to 24,000 acres remain in the Rainwater basin (15).

Three MLRA's totaling 26.5 million acres were used to approximate the Sandhill and Rainwater basin areas. Although 9.5 million acres were cropped in 1982, the predominant use was rangeland. Only 859,000 acres of non-Federal wetlands are found in the three areas; of that, 26,000 had high potential for conversion and 105,000 had medium potential.

Forested Wetlands of the Lower Mississippi Alluvial Plain

The wetlands of the Lower Mississippi are prime overwintering habitat for waterfowl, and provide fish spawning and nursery grounds, flood storage, and water quality maintenance. About 80 percent of the original 24 million acres of wetlands are gone, leaving about 5.2 million acres. Agricultural conversion has been the predominant cause of conversion, with Federal flood control and small watershed programs accelerating cropland conversion. Conversion threatens wildlife populations and also increases the frequency of damaging floods (43).

Two MLRA's were used to approximate the area, with a total acreage of 41 million acres. More than one-half (22 million acres) was in cropland in 1982, with the remainder largely in forest. Non-Federal wetlands in the two areas covered more than 4 million acres. Only 96,000 acres (2.4 percent) had high potential for conversion, while 302,000 had medium potential.

North Carolina's Pocosins

Conversion of North Carolina's pocosin wetlands through farming and forestry is a serious threat in the coastal plain. About 70 percent of the Nation's pocosins occur in North Carolina. They provide habitats for a variety of species, stabilize water quality, and balance salinity in coastal waters. Approximately 1 million acres of pocosins remain. Major timber companies own about 44 percent of the State's pocosins, but large tracts are being transferred to agricultural corporations. Conversion of pocosins is generally limited to large-scale agriculture because of the large investments required. The converted land creates runoff problems for adjacent estuaries. A more recent threat to the pocosins is peat mining (43).

It was not possible to isolate the North Carolina pocosins by MLRA. Therefore, we used coastal wetlands in two MLRA's that encompass the North Carolina pocosins as well as wetlands in South Carolina and Georgia, not all of which are pocosins. These two MLRA's cover almost 25 million acres in the three States. Only 4.7 million acres were in crops at the time of the 1982 inventory, with a majority still in forest. A total of 7.7 million acres of non-Federal wetlands were in these two areas, with 18,000 acres having high potential for conversion and 271,000 acres having medium potential.

Western Riparian Wetlands

Riparian wetlands are lands along the floodplains and the margins of ponds and lakes in arid and semiarid regions. These narrow strips of vegetation are disproportionately important to wildlife, supporting a great variety of species. The riparian wetlands form an integrated system with adjacent uplands, and are therefore difficult to distinguish; together, the two ecosystems provide food and cover to both resident and migratory species. Crop conversion, overgrazing, dam construction, and groundwater pumping have altered, severely damaged, or destroyed riparian wetlands to the point where they are considered the most modified land type in the West. For example, 44 percent of cottonwood communities along the Colorado River in Arizona have been lost and 98 percent of the original riparian forest along California's Sacramento River is gone. Remaining riparian lands suffer from poor water quality and reduced streamflows (43).

Western riparian areas are difficult to approximate with MLRA's because they occur along rivers in Arizona, New Mexico, Utah, Nevada, Colorado, California, Oregon, and Washington. Seven MLRA's were used to capture riparian wetlands, with a total of 45 million acres. In 1982, the predominant land use was rangeland, with 11 million acres in cropland. Wetlands in the seven areas covered 1.4 million acres. Only 2,000 acres had high potential for conversion, and 33,000 had medium potential.

Other Problem Areas for Conversion

Since only one-third of wetlands with high cropland conversion potential were captured in the six problem areas, we identified all other MLRA's with substantial wetlands of high and medium potential. Eight such areas are listed in table 15 and shown in figure 6. These areas, concentrated in the Southeast and the Corn Belt, contain an additional 20.8 million acres of wetlands, including 45 percent of high conversion potential acres and 29 percent of medium conversion potential acres. Taken together, the first six problem areas and these eight areas include 57 percent of non-Federal wetland acres, and capture 82 percent of all wetlands with high conversion potential.

Several of the additional eight areas are considered important for waterfowl: Puget Sound, the Hudson

Table 15—Conversion potential of other wetland problem areas, 1982

Area	High	Medium	Unlikely	Other[1]	Total
			1,000 acres		
Corn Belt States MLRA's 111,112-115, 139	63	169	500	556	1,471
Kentucky-Tennessee MLRA's 120-124	49	86	163	181	551
Appalachia/Southern Piedmont MLRA's 128, 136	57	228	1,073	139	1,810
Southern Coastal Plain MLRA's 133a, 135	123	509	4,762	1,080	9,328
Hudson River Valley MLRA 144a	9	30	472	480	1,317
Northern Minnesota MLRA 88	13	52	644	1,728	3,449
Washington-Oregon MLRA 2	19	55	121	84	335
Lake States MLRA's 95a, 95b, 98	32	138	1,418	378	2,520
Total	365	1,267	9,153	4,626	20,781
Total non-Federal	813	4,371	28,467	25,986	78,384
			Percent		
Percent of non-Federal	45	29	32	18	27

[1] Includes wetland with no conversion potential and where conversion potential was not estimated.

River Valley, and the Lake States of Michigan and Wisconsin. The area in Northern Minnesota is next to the prairie pothole region. In the Corn Belt States and the Kentucky-Tennessee area, wetlands comprise only about 2 percent of all land. These remnant areas may be critically important for remaining wetland-dependent wildlife. Cropland was the predominant land use only in the Corn Belt States and the Lake States in 1982. In the Kentucky-Tennessee area, a combination of forest, pasture, and range dominated; in the other areas, the major land use was forest.

Conclusions and Policy Implications

The analyses in this report support three major conclusions about agricultural conversion of wetlands. First, conversion to farmland was the leading cause of wetland loss between the 1950's and 1970's, responsible for 87 percent of a 13.8-million-acre net loss in wetlands. Of 78.4 million non-Federal wetland acres remaining in 1982, 59.9 million were privately owned and subject to agricultural conversion. Of that, some 42.9 million acres could probably be farmed if converted. However, high conversion costs and other obstacles limit the number of wetland acres with high and medium cropland potential to only 5.1 million.

Second, wetlands are sufficiently productive, if cleared and drained, to make an operating profit under expected season-average market prices for Government program crops. However, relatively few additional acres would be profitable to crop with deficiency payments from price support programs. The Internal Revenue Code provides income tax subsidies for wetland conversion in amounts that vary with the tax bracket of the operator. Together, price supports and tax subsidies help offset high clearing and drainage costs, which are the principal obstacles to wetland conversion.

Third, although agricultural conversion is economically feasible for some wetlands, analysis of wetland values suggests that, in many cases, the social benefits from intact wetlands exceed the potential private returns. Further, the social benefits of draining wetlands to expand cropland are likely to be zero or negative if current crop surpluses continue. Despite that, agricultural conversion for private benefit is a major threat to wetlands in six of nine nationally recognized critical wetland problem areas. The six areas, and eight other wetland problem areas, accounted for 57 percent of wetlands in 1982. These 14 problem areas had 82 percent of the wetlands judged to have high potential for conversion to cropland, and 63 percent of the medium-potential wetlands. Since 85 percent of these areas could be converted without major effort, Federal and State regulatory programs are not likely to prevent their conversion.

Denying farm program benefits to operators growing program crops on converted wetlands will discourage conversion to the extent that benefits offset fixed costs of clearing and draining. However, important conversion incentives will remain in the form of tax deductions for clearing and drainage investments. Tax subsidies may be more important for high-bracket operators, who may be less concerned with price supports. Nonetheless, regardless of swampbuster sanctions or income tax reforms, some kinds of wetland conversion will probably continue. These include harvesting timber, removing nuisance wetlands in existing fields, and lowering water tables through irrigation pumping and flood-control channelization.

Enforcement of swampbuster sanctions will be difficult for a number of reasons. For example, identifying wetlands has been a rather subjective undertaking on which even experts have disagreed. The hydric soils definition of wetlands, jointly arrived at by the U.S. Fish and Wildlife Service and USDA, does remove much of the arbitrary character of wetland determination. However, the exact list of hydric soils and hydrophytic vegetation to include in the definition must still be refined.

The 1985 legislation defines "converted wetland" as land converted from wetland at any time in the past. Hence operators who had not cropped converted wetland between 1981 and 1985 would lose farm program eligibility, even if they had not carried out the conversion themselves. Conceivably, lands mapped as hydric soils that had been cleared and drained long before for timber production or other purposes would, if cropped by a subsequent owner, be denied farm program benefits.

An operator subject to the swampbuster sanctions loses eligibility for farm programs on all land farmed, not just converted wetland. This feature creates a more powerful sanction than if eligibility were denied for converted wetland alone, but also sets up incentives for evasion. Small operators contemplating a conversion that will marginally increase their cropland, as is typical of conversions in the prairie pothole region, probably would be deterred by threatened loss of all program benefits on their remaining acreage. However, larger corporate operations based predominately on converted wetland have the means and incentive to divide their holdings into two parts: a "white-hat" operation, with previously converted and cropped land eligible for farm programs, and a "black-hat" operation, which would continue to convert and farm wetlands outside the price-support programs. Such legal evasions may blunt the effectiveness of the swampbuster provisions, and they may be practiced by precisely the operators who convert the most wetland.

Finally, the essential weakness of any provisions linked to denial of farm program benefits is that relatively few operators currently participate in farm programs. Data for 1978 show that only 35 percent of farms participated in farm programs, and they accounted for only 53 percent of normal crop acreage (*19*). In 1982, only 23 percent of total cropland was enrolled in commodity programs (*31*). Participation in 1984 was higher, at 56 percent of base acreage (*47*). Participation by wetland converters is not known, but may be lower than average since crop histories may not yet have been established on converted land.

Despite these problems, denying farm program benefits for converted wetlands may well reduce the economic incentive to clear and drain such land. The swampbuster provision should at least ensure greater consistency between USDA resource protection and commodity support programs.

References

1. Adamus, P. R., and L. T. Stockwell. *A Method for Wetland Functional Assessment: Volume I.* U.S. Dept. Trans., Fed. Highway Adm., 1983.

2. American Society of Agricultural Engineers, Drainage Committee. *Problems and Needs in Agricultural Drainage, Report . . . 1945-1946.* St. Joseph, MI, 1946.

3. Anderson, J. R., and H. W. Dill, Jr. *Land Clearing and Drainage in Eastern North Carolina.* ARS 43-127. U.S. Dept. Agr., Agr. Res. Serv., Jan. 1961.

4. Bardecki, M. J. "What Value Wetlands?," *Journal of Soil and Water Conservation*, Vol. 39, No. 3, (May-June 1984), pp. 166-169.

5. Barrows, R., D. Henneberry, and S. Schwartz. "Individual Economic Incentives, the Tax System and Wetland Protection Policy: A Study of Returns to Wetland Drainage in Southeastern Wisconsin." Paper No. 82-2074, presented at American Society of Agricultural Engineers summer meetings, Univ. of Wisconsin-Madison, June 27-30, 1982.

6. Bureau of National Affairs. *Daily Tax Report.* No. 208, (Oct. 28, 1985), p. G-8.

7. Carter, L. J. "Agriculture: A New Frontier in Coastal North Carolina," *Science*, Vol. 189 (July 25, 1975), pp. 271-5.

8. Cowardin, L. M., and others. *Classification of Wetlands and Deepwater Habitats of the United States.* FWS/OBS-79/31. U.S. Fish and Wildlife Serv., Dec. 1979.

9. Council on Environmental Quality. *Our Nation's Wetlands—An Interagency Task Force Report.* U.S. Government Printing Office, 1978.

10. Daugherty, A. B., personal communication, Nov. 30, 1984.

11. Dideriksen, R. I., A. R. Hidlebaugh, and K. O. Schmude. *Potential Cropland Study.* SB-578. U.S. Dept. Agr., Soil Cons. Serv., Oct. 1977.

12. Fischer, V., and others. *A Survey of the Public's Attitudes Toward Soil, Water, and Renewable Resources Conservation Policy.* Study No. 792802. New York: Louis Harris and Associates, 1980.

13. Frayer, W. E., and others. *Status and Trends of Wetlands and Deepwater Habitats in the Coterminous United States, 1950's to 1970's.* Colorado State Univ., Dept. of Forest and Wood Sciences, Apr. 1983.

14. Gray, L. C., and others. "Utilization of Our Lands for Crops, Pasture, and Forests." *Agriculture Yearbook 1923.* U.S. Dept. Agr., 1924, pp. 415-506.

15. Great Plains Office of Policy Analysis. *Wetland Trends and Protection Programs in Nebraska.* Univ. of Nebraska, Sept. 1982.

16. Hammack, J., and G. M. Brown, *Waterfowl and Wetlands: Towards Bioeconomic Analysis.* Baltimore: Johns Hopkins Univ. Press, 1974.

17. Heimlich, R. E. *Sodbusting: Land Use and Farm Programs.* AER-536. U.S. Dept. Agr., Econ. Res. Serv., June 1985.

18. Herrington, B. E. and R. N. Shulstad. "Conversion of Delta Woodland and Pasture to Cropland: Economic Feasibility and Implications." Agr. Exp. Sta. Bull. 858. Univ. of Arkansas-Fayetteville, Dept. of Agr. Econ., Mar. 1982.

19. Johnson J. D., and S. D. Short. "Commodity Programs: Who Has Received the Benefits?" Presented at American Agricultural Economics Association annual meeting, West Lafayette, IN, Aug. 1983.

20. Krenz, R. D. "The USDA-ERS Firm Enterprise Data System: Capabilities and Applications," *Southern Journal of Agricultural Economics*, Vol. 7, No. 1 (1975), pp. 33-38.

21. Leitch, J. A., and D. Kerestes. "Agricultural Land Drainage Costs and Returns in Minnesota." Staff Paper P81-15, Univ. of Minnesota-St. Paul, Dept. of Agr. and Applied Econ., Sept. 1981.

22. Leitch, J. A., and D. F. Scott. "Economic Impact of Flooding on Agricultural Production in Northeast Central North Dakota." Agr. Econ. Rpt. No. 120, North Dakota State Univ. Fargo, Dept. of Agr. Econ., 1977.

23. Lewis, D. "Land Drainage Investment Survey, 1975-77—A Report on a Landownership Follow-on Survey." Staff Report AGES820525, U.S. Dept. Agr., Econ. Res. Serv., June 1982.

24. Lewis, D. "Land Clearing Investment Survey, 1975-77—A Report on a Landownership Follow-on Survey." Staff Report AGES820728, U.S. Dept. Agr., Econ. Res. Serv., Aug. 1982.

25. Martin, A. C., and others. *Classification of Wetlands of the United States*. Spec. Sci. Rep.-Wildlife 20. U.S. Fish and Wildlife Serv., 1953.

26. Miller, J. R., and M. J. Hay. "Determinants of Hunter Participation: Duck Hunting in the Mississippi Flyway." *American Journal of Agricultural Economics*, Vol. 63, No. 4, Nov. 1981, pp. 677-684.

27. Nelson, W. C., and others. *Wetlands in the Prairie Pothole Region of Minnesota, North Dakota, and South Dakota: Trends and Issues*. North Dakota State Univ., Aug. 1982.

28. Office of Technology Assessment. *Wetlands: Their Use and Regulation*. OTA-O-206. U.S. Congress, Mar. 1984.

29. Ogg, C. W. "Cross-compliance Proposals and Fragile Croplands." Presented at American Agricultural Economics Association annual meetings, West Lafayette, IN, Aug. 1983.

30. Pavelis, G. A. "Natural Resource Formation in American Agriculture: Irrigation, Drainage, and Conservation, 1855-1980." Staff Report AGES850725. U.S. Dept. Agr., Econ. Res. Serv., Sept. 1985.

31. Reichelderfer, K. H. *Do USDA Farm Program Participants Contribute to Soil Erosion?* AER-532. U.S. Dept. Agr., Econ. Res. Serv., Apr. 1985.

32. Richardson, C. J., and J. P. Royer. *Wetland Trends and Policies in North Carolina and South Carolina*. OTA Case Study 233-4550. Duke Univ., School of Forestry and Environmental Studies, Durham, N.C. Aug. 1982.

33. Robertson, P. "The Truth About Ducks," *Sporting Classics*. Vol. 4, No. 4, (Aug. 1985), pp. 68-77.

34. Russell, C. R., and W. B. Sundquist. "Landowner Factors in Developing New Cropland in Minnesota," *Minnesota Agricultural Economist* No. 646, (June 1984).

35. Schenarts, T. N. "Dynamics of Agricultural Land Use Change," *Agricultural Land Availability: Papers on the Supply and Demand for Agricultural Lands in the United States*. Prepared for the Committee on Agriculture, Nutrition, and Forestry, U.S. Senate, July 1981.

36. Shabman, L. A. "Economic Incentives for Bottomland Conversion: The Role of Public Policy and Programs." *Transactions of Forty-Fifth North American Wildlife and Natural Resources Conference*, 1980.

37. Shabman, L. A., and S. S. Batie. "Socioeconomic Functions and Values of Wetlands: A State-of-the-Art Review," U.S. Army Corps of Engineers, Vicksburg, MS, Nov. 1985 (working draft).

38. Shaw, S. P., and C. G. Fredine. *Wetlands of the United States: Their Extent and Their Value to Waterfowl and Other Wildlife*. Circular 39. U.S. Fish and Wildlife Serv., U.S. Dept. Int., 1956.

39. Student Note. "Taxation Affecting Agricultural Land Use," *Iowa Law Review*. Vol. 50 (1965), pp. 600-618.

40. Stucker, B. C., and K. J. Collins. *The Food Security Act of 1985: Major Provisions Affecting Commodities.* AIB-497. U.S. Dept. Agr., Econ. Res. Serv., Jan. 1986.

41. Swader, F., and G. A. Pavelis. "Drainage Challenges and Opportunities," in *Farm Drainage in the United States: History, Status, and Prospects.* U.S. Dept. of Agr., Econ. Res. Serv. (in process).

42. Thompson, R. "America's Disappearing Wetlands," *Congressional Quarterly Editorial Research Reports,* Aug. 19, 1983, pp. 615-631.

43. Tiner, R. W., Jr. *Wetlands of the United States: Current Status and Recent Trends.* National Wetlands Inventory, U.S. Fish and Wildlife Serv., Mar. 1984.

44. Toon, T. G. "Factors Affecting Land Use Change in the Lower Mississippi Alluvium." Unpublished manuscript. U.S. Dept. Agr., Econ. Res. Serv., 1976.

45. U.S. Department of Agriculture. *Soil and Water Resources Conservation Act, 1980 Appraisal.* Parts I and II, 1980.

46. ______, Econ. Res. Serv. *Agricultural Outlook.* June 1985.

47. ______, Office of Information. "Final Acreage Reduction Report Shows 57 Million Acres Wheat Signed Up." News Release 519-84. May 15, 1984.

48. ______, Soil Conservation Service. Soils-Hydric Soils of the United States. National Bulletin No. 430-6-3. Nov. 12, 1985.

49. ______. *National Soils Handbook.* Part 603, Application of Soil Information. pp. 603-i—603-222. July 1983.

50. ______. "Conservation Memorandum-15," May 5, 1975.

51. ______. *Basic Statistics of the National Inventory of Soil and Water Conservation Needs.* SB-317. Aug. 1962.

52. ______. *Basic Statistics—National Inventory of Soil and Water Conservation Needs, 1967.* SB-461. Jan. 1971.

53. ______. *Basic Statistics, 1977 National Resources Inventory.* SB-686. Dec. 1982.

54. ______, and Iowa State University Statistical Laboratory "National Resources Inventory—A Guide for Users of 1982 NRI Data Files." Unpublished manuscript. Oct. 1984.

55. U.S. Dept. of the Treasury, Internal Revenue Service. *Farmer's Tax Guide.* Pub. No. 225, 1984.

56. Watts, M. J., L. D. Bender, and J. B. Johnson. "Economic Incentives for Converting Rangeland to Cropland." Bull. 1302. Montana State Univ.-Bozeman, Coop. Ext. Serv., Nov. 1983.

57. Wright, J. O. *Swamp and Overflowed Land in the United States.* Circular 76. U.S. Dept. Agr., 1907.

Appendix 1—Wetland Data

Early wetland inventories treated all wetlands the same, describing the object of their investigations with such terms as "swamp and overflowed lands" (*57*). Scientific inventories by the U.S. Fish and Wildlife Service used two similar but distinct wetland classification systems based on characteristics of the land, water, and formation of wetlands. A third definition of wetlands, developed by an interagency committee, is based on the combination of soil properties and vegetation.

Classification

The classification used in the first Fish and Wildlife survey (1954), commonly called the Circular 39 classification, distinguished between coastal and inland areas of fresh and saline wetlands. Within these four broad categories, 20 wetland types were classified on the basis of water depth and vegetation (*25*).

For the National Wetland Status and Trends Analysis (*13*), a new classification system was designed to rectify problems with the older system. In particular, the Circular 39 system ignored ecologically important differences in wetlands and grouped together dissimilar wildlife habitats that are geographically separated. Also, the system was inadequately defined, leading to inconsistencies in application. The NWSTA classification includes both wetlands and deepwater habitats, grouping them in a hierarchical structure on the basis of hydrologic, geomorphologic, chemical, and biological factors. Five major systems form the first level in the hierarchy. These are further subdivided into subsystems based on degree of inundation, classes, subclasses, and dominance types (*8*).

The National Technical Committee for Hydric Soils, made up of representatives from the Soil Conservation Service, the Fish and Wildlife Service, Army Corps of Engineers, and universities, developed a soils definition (*49*). A list of soils meeting the hydric soils definition was identified, although some phases of these soils may be excluded.

Inventories

Analyses in this report are based on a variety of data available on wetlands and their potential for agricultural conversion. Each source is briefly described here; for further details, consult the list of references.

1906 USDA Drainage Inventory (57). Successive attempts have been made at the national level to inventory the agricultural potential of remaining wetlands and the need for drainage to develop those lands. This first modern attempt surveyed knowledgeable people in each county in the humid eastern part of the country. A total of 79 million acres of swampland were thought to have farm potential. One-third of this acreage was in intermittent crop use or wet pasture suited to improved drainage, while the remaining two-thirds was not fit for cultivation unless cleared and drained.

1919 USDA Drainage Inventory (14). This was a more comprehensive inventory based on drainage investigations and soil surveys. The inventory showed 91.5 million acres of land unfit for crops without drainage, with two-thirds in the South and half of the rest in the Lake States. The study estimated that only 75 million of the 91.5 million acres could ever be developed for agriculture, with the remainder in very deep peat or in coastal marshes unsuitable for crops. Further, 68 percent of these 75 million acres would have also required clearing of brush or trees, and some land would have had unfavorable fertility or texture if drained.

1946-48 American Society of Agricultural Engineers Drainage Survery (2). This effort identified 97 million acres of wet, swampy, and overflow lands, 20 million acres of which could be drained for farming at a reasonable cost. Of the land adaptable to farming, one-third was in cultivation and needed drainage improvements, and the remaining two-thirds was undeveloped land. A related 1948 estimate by the Soil Conservation Service showed 20.7 million acres physically feasible to drain and develop for agriculture.

1954 Wetlands Inventory (Circular 39) (38). The Fish and Wildlife Service (FWS) and State fish and game departments cooperated to inventory wetlands used by waterfowl. The inventory counted 74.4 million acres of wetlands, classified according to the 20 types of the older FWS classification.

1958 Conservation Needs Inventory (CNI) (51). This USDA inventory identified land needing drainage and small watershed projects needed for water management through farm drainage. A total of 73.5 million acres were judged to need treatment for excess water, more than 80 percent of which was cropland. Pasture and rangeland with excess water that needed treatment totaled 13.6 million acres. Some 172.5 million acres had drainage problems, of which 45.5 million acres needed small watershed projects.

1975 Potential Cropland Survey (11). This Soil Conservation Service (SCS) survey recorded 21.4 million acres of high and medium potential cropland that suffered from wetness. Of these, 16.5 million acres had seasonal high water table, 4.6 million had problems with drainage outlets, and 181,300 were identified as wetland types 3-20.

1977 National Resources Inventory (NRI) (53). This SCS inventory identified 41.5 million acres in wetland types 3-20, but none was rated as having high or medium potential for conversion to cropland.

1979-83 National Wetlands Status and Trends Analysis (NWSTA) (13). Conducted by FWS between 1979 and 1983, this study developed statistical estimates of acreage in wetland and deepwater habitat for the lower 48 States during the 1950's and the 1970's, and the change in that period. A stratified random sample of 3,635 4-square mile units was constructed. Black and white aerial photography from the 1950's and 1970's, selected for each sample unit, was interpreted for wetlands, changes in wetlands, and the cause of change. The sample universe included all private and public wetlands in the lower 48 States, including coastal intertidal areas and inland water bodies. The sample was designed to achieve a 90-percent probability that estimates are within a 10-percent range in each category.

1982 National Resources Inventory (NRI) (54). Conducted by SCS, this study inventoried soil and related water resources in the lower 48 States, Hawaii, and U.S. Caribbean territories. A two-stage stratified random sample was used to collect data from field observations at 841,860 sample points in nearly 350,000 primary sampling units of approximately 160 acres each. The sample universe included non-Federal rural land classified by both the 20 wetland types of FWS Circular 39 and the five major wetland systems used in the NWSTA. The NRI wetland acreage reported for 1982 is smaller than that reported in the NWSTA for three reasons: exclusion of Federal wetlands, possible undercounting of intermittently wetlands, and losses of wetlands since the mid-1970's. Advantages of the NRI data over the NWSTA are: assessment of cropland conversion potential; inclusion of soil, vegetation, and wildlife habitat measures; and cross-identification to the SCS Soil Interpretation Data (SOILS Form 5), which includes estimated potential crop yields for wetland soils. The NRI sample was designed to achieve a 95-percent confidence interval around estimates of acreages comprising at least 10 percent of the land area within particular major land resource areas (MLRA's).

Appendix 2—Two Hypothetical Farms

North Carolina Pocosins. This farm is based primarily on conversion costs and operating data collected by Arthur Daugherty and Doug Lewis (Econ. Res. Serv., U.S. Dept. Agr.) in interviews with farm operators and drainage contractors in North Carolina. Supplemental 1982 agricultural census data and average 1982 crop budgets from the Federal Enterprise Data System (FEDS) were also used. A tax simulation model representing individual returns was used as an analytical framework, but many larger operations, for which taxes may be an important consideration in wetland conversion, are corporations.

Assumptions: 1,000-acre cash-grain farm converting 320 acres of pocosins.

	Corn	Soybeans/wheat (double cropped)	Rotation average
Production costs per acre:			
Variable costs	$168.24	$186.35	$179.11
Fixed costs (excluding conversion)	87.49	123.13	108.87
Total	255.73	309.48	287.98
rotation	.40	.60	1.00
Prices and yields:			
Season-average per bushel	$2.50	$5.84/$2.57	
Target (loan for soybeans)	3.03	5.02/ 4.38	
1st year bushels per acre	100	25/30	
2nd year	125	30/35	
3rd and subsequent years	150	35/40	
Conversion costs per acre:			
Acquisition		$200.00	
Drainage—			
Surveying		11.30	
Pump station		131.92	
Canals and V-ditches		156.26	
Culverts and roads		30.69	
Clearing		744.99	
Land development		157.02	
Soil amendment		147.00	
Total		1,579.18	

The 320-acre conversion is assumed sold in the 10th year. The current dry cropland price of $1,350 per acre is almost $1,000 less than the break-even liquidation price of $2,315 needed to achieve the same after-tax income as before conversion.

Details of the net present value (NPV) and total year 1-10 columns of the tax model are shown in appendix table 1.

North Dakota Prairie Pothole. This farm is based on descriptions of farming in the region in Nelson, and others (27) and on representative farms in Barrows, and others (5). Supplemental data from 1982 agricultural census and average 1982 FEDS crop budgets were also used.

Assumptions: 1,170-acre wheat farm converting a 10-acre pothole wetland.

	Wheat	
Production costs per acre:		
Variable costs	$51.78	
Fixed costs (excluding conversion)	74.81	
Total	126.59	
Prices and yields:		
Season-average per bushel	$2.87	
Target	4.38	
1st and subsequent years bushels per acre	35	
Conversion costs per acre:		
Acquisition	$0.00	assumed owned
Drainage—ditching	187.20	
Total	187.20	

The 10-acre conversion is assumed sold in the tenth year for $600 per acre.

Details of the net present value (NPV) and total year 1-10 columns of the tax simulation model are shown in appendix table 2.

Appendix table 1—Land improvement tax simulation, North Carolina Pocosin

Item	No conversion, with payments		With conversion, with payments		With conversion, no payments	
	NPV[1]	Years 1-10	NPV[1]	Years 1-10	NPV[1]	Years 1-10
			Dollars			
Land purchase	0	0	60,952	64,000	60,952	64,000
Nondepreciable improvements, soil and water:						
Leveling and grading	0	0	280,835	317,668	280,835	317,668
Soil conditioning	0	0	81,782	92,557	81,782	92,557
Terracing	0	0	0	0	0	0
Restoration of fertility	0	0	0	0	0	0
Diversion channels	0	0	0	0	0	0
Drainage ditches	0	0	129,710	148,524	129,710	148,524
Irrigation ditches	0	0	0	0	0	0
Earthen dams	0	0	0	0	0	0
Watercourses and outlets	0	0	0	0	0	0
Ponds	0	0	0	0	0	0
Eradication of brush	0	0	0	0	0	0
Windbreaks	0	0	0	0	0	0
SCWD assessments	0	0	0	0	0	0
Total	0	0	492,327	558,749	492,327	558,749
Nondepreciable improvements, land clearing:						
Removal of trees and rocks	0	0	131,481	148,691	131,481	148,691
Earthmoving	0	0	0	0	0	0
Drainage and filling	0	0	0	0	0	0
Total	0	0	131,481	148,691	131,481	148,691
Depreciable improvements:						
Drainage tile (1245)[2]	0	0	0	0	0	0
Machinery and equipment (1245)	0	0	78,775	89,071	78,775	89,071
Depreciable amount	0	0	66,425	75,117	66,425	75,117
Multi-purpose buildings (1250)	0	0	0	0	0	0
Single-purpose buildings (1245)						
Depreciable amount	0	0	0	0	0	0
Total	0	0	66,425	75,117	66,425	75,117
Financing improvements:						
Finance period						
Long-term balance	0	0	3,471,162	4,710,783	3,471,162	4,710,783
Long-term payment	0	0	545,087	823,519	545,087	823,519
Interest payments	0	0	173,558	235,539	173,558	235,539
Other improvements, tax items:						
Farm business receipts	2,962,622	3,923,335	3,668,283	4,887,298	3,556,394	4,737,415
Farm business expenses	2,158,036	2,857,840	2,819,107	3,745,268	3,084,446	4,108,180
Nonfarm income	830,641	1,100,000	830,641	1,100,000	830,641	1,100,000
Adjustments to income	166,128	220,000	166,128	220,000	166,128	220,000
Tax calculation improvements:						
Gross farm income Sch F 1.31[3]	2,962,622	3,923,335	3,668,283	4,887,298	3,556,394	4,737,415
Consv. exp. Sch F 1.49	0	0	460,781	558,749	458,502	558,749
Land clearing exp Sch F 1.50	0	0	0	0	0	0

See footnotes at end of table.

continued

Appendix table 1—Land improvement tax simulation, North Carolina Pocosin, continued

Item	No conversion, with payments		With conversion, with payments		With conversion, no payments	
	NPV[1]	Years 1-10	NPV[1]	Years 1-10	NPV[1]	Years 1-10
			Dollars			
Tax calculation improvements:						
5-year ACRS depreciation	0	0	60,059	75,117	60,059	75,117
18-year ACRS SL depreciation	0	0	0	0	0	0
Depreciation Sch F 1.53	0	0	60,059	75,117	60,059	75,117
Deductions less 1.50	2,158,036	2,857,840	3,522,359	4,624,673	3,785,420	4,987,585
Total deduction Sch F 1.55	2,158,036	2,857,840	3,522,359	4,624,673	3,785,420	4,987,585
Net farm income Sch F 1.56	804,586	1,065,495	145,924	262,625	(229,026)	(250,170)
Investment credit F3468 1.22	0	0	6,642	7,512	6,642	7,512
Farm income 1040 1.19	804,586	1,065,495	145,924	262,625	(229,026)	(250,170)
Other deductions 1040 1.	83,064	110,000	83,064	110,000	83,064	110,000
Total income 1040 1.23	1,552,163	2,055,495	1,060,931	1,538,986	685,981	1,026,191
Adjusted gross 1040 1.32	1,386,035	1,835,495	894,802	1,318,986	519,853	806,191
Total taxes 1040 1.40	538,518	713,148	349,378	521,803	254,340	377,770
Business credit 1040 1.48	0	0	2,915	3,554	2,526	3,554
Taxes owed 1040 1.50	538,518	713,148	346,463	518,249	251,814	374,215
Capital gains improvements (long-term):						
Capitalized S&WC investments	0	0	0	0	0	0
Basis of new land	0	0	2,647,895	4,397,921	2,647,895	4,397,921
Sale	0	0	433,130	740,800	433,130	740,800
Long-term capital gain	0	0	308,774	528,109	308,774	528,109
Long-term capital loss	0	0	0	0	0	0
Loss carryover	0	0	0	0	0	0
Tax on capital gain	0	0	50,880	87,022	50,880	87,022
Recapture improvements:						
S&WC and clearing 4797 1.23(c)						
Years held						
Recapture percentage						
Subject deductions	0	0	460,781	558,749	458,502	558,749
Recapture amount 1040 1.15	0	0	0	0	0	0
Investment credit 4255						
Recapturable amount	0	0	18,706	22,535	18,706	22,535
Recapture amount 1040 1.53	0	0	0	0	0	0
ACRS depreciation 4797 1.21(b)						
Recapture amount	0	0	43,920	75,117	43,920	75,117
Total recapture	0	0	43,920	75,117	43,920	75,117
After-tax income	1,096,709	1,452,348	1,097,043	1,428,372	814,464	1,059,610

[1] Discounted net present value.

[2] Section of the Internal Revenue Code.

[3] IRS form and line number follow each entry where applicable.

Appendix table 2—Land improvement tax simulations, North Dakota Prairie Pothole

Item	No conversion, with payments		With conversion, with payments		With conversion, no payments	
	NPV[1]	Years 1-10	NPV[1]	Years 1-10	NPV[1]	Years 1-10
			Dollars			
Land purchase	0	0	0	0	0	0
Nondepreciable improvements, soil and water:						
Leveling and grading	0	0	0	0	0	0
Soil conditioning	0	0	0	0	0	0
Terracing	0	0	0	0	0	0
Restoration of fertility	0	0	0	0	0	0
Diversion channels	0	0	0	0	0	0
Drainage ditches	0	0	0	0	0	0
Irrigation ditches	0	0	0	0	0	0
Earthen dams	0	0	0	0	0	0
Watercourses and outlets	0	0	0	0	0	0
Ponds	0	0	0	0	0	0
Eradication of brush	0	0	0	0	0	0
Windbreaks	0	0	0	0	0	0
SCWD assessments	0	0	0	0	0	0
Total	0	0	0	0	0	0
Nondepreciable improvements, land clearing:						
Removal of trees and rocks	0	0	0	0	0	0
Earthmoving	0	0	0	0	0	0
Drainage and filling	0	0	816	900	816	900
Total	0	0	816	900	816	900
Depreciable improvements:						
Drainage tile (1245)[2]	0	0	882	972	882	972
Machinery and equipment (1245)	0	0	0	0	0	0
Depreciable amount	0	0	0	0	0	0
Multi-purpose buildings (1250)	0	0	0	0	0	0
Single-purpose buildings (1245)						
Depreciable amount	0	0	0	0	0	0
Total	0	0	0	0	0	0
Financing improvements:						
Finance period						
Long-term balance	0	0	11,823	15,801	11,823	15,801
Long-term payment	0	0	1,783	2,662	1,783	2,662
Interest payments	0	0	591	790	591	790
Other improvements (tax items):						
Farm business receipts	1,196,300	1,584,233	1,213,402	1,604,022	1,020,037	1,341,084
Farm business expenses	984,212	1,303,371	991,660	1,313,498	1,211,363	1,612,250
Nonfarm income	83,064	110,000	83,064	110,000	83,064	110,000
Adustments to income	16,613	22,000	16,613	22,000	16,613	22,000
Tax calculations improvements:						
Gross farm income Sch F 1.31[3]	1,196,300	1,584,233	1,213,402	1,604,022	1,020,037	1,341,084
Consv. exp. Sch F 1.49	0	0	0	0	0	0
Land clearing exp Sch F 1.50	0	0	816	900	0	0

See footnotes at end of table.

continued

Appendix table 2—Land improvement tax simulations, North Dakota Prairie Pothole, continued

Item	No conversion, with payments		With conversion, with payments		With conversion, no payments	
	NPV[1]	Years 1-10	NPV[1]	Years 1-10	NPV[1]	Years 1-10
			Dollars			
Tax calculations improvements:						
5-year ACRS depreciation	0	0	0	0	0	0
18-year ACRS SL depreciation	0	0	0	0	0	0
Depreciation Sch F 1.53	0	0	0	0	0	0
Deductions less 1.50	984,212	1,303,371	993,133	1,315,260	1,212,836	1,614,012
Total deduction Sch F 1.55	984,212	1,303,371	993,949	1,316,160	1,212,836	1,614,012
Net farm income Sch F 1.56	212,087	280,863	219,453	287,862	(192,799)	(272,928)
Investment credit F3468 1.22	0	0	0	0	0	0
Farm income 1040 1.19	212,087	280,863	219,453	287,862	(192,799)	(272,928)
Total income 1040 1.23	282,692	374,363	291,461	383,762	(121,002)	(177,388)
Adjusted gross 1040 1.32	266,079	352,363	274,848	361,762	(137,615)	(199,388)
Total taxes 1040 1.40	44,749	59,260	47,614	62,322	8,674	9,107
Business credit 1040 1.48	0	0	0	0	0	0
Taxes owed 1040 1.50	44,749	59,260	47,614	62,322	8,674	9,107
Capital gains improvements (long-term):						
Capitalized S&WC investments	0	0	0	0	0	0
Basis of new land	0	0	0	0	10,682	18,000
Sale	0	0	3,508	6,000	3,508	6,000
Long-term capital gain	0	0	3,508	6,000	2,982	5,100
Long-term capital loss	0	0	0	0	0	0
Loss carryover	0	0	0	0	0	0
Tax on capital gain	0	0	0	0	0	0
Recapture improvements:						
S&WC and clearing 4797 1.23(c)						
Years held						
Recapture percentage						
Subject deductions	0	0	816	900	0	0
Recapture amount 1040 1.15	0	0	0	0	0	0
Investment credit 4255						
Recapturable amount	0	0	0	0	0	0
Recapture amount 1040 1.53	0	0	0	0	0	0
ACRS depreciation 4797 1.21(b)						
Recapture amount	0	0	0	0	0	0
Total recapture	0	0	0	0	0	0
After-tax income	250,403	331,603	258,918	341,540	(115,737)	(167,836)

[1] Discounted net present value.

[2] Section of the Internal Revenue Code.

[3] IRS form and line number.

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Readings On

Soil Conservation and Farmland

Assessing Erosion on U.S. Cropland: Land Management and Physical Features, by Nelson L. Bills and Ralph E. Heimlich. AER-513. July 1984. 24 pp. $1.50. Order SN: 001-019-00341-3 from GPO.

Erosion from rainfall causes nearly 100 million acres of U.S. cropland to erode by more than 5 tons per acre per year. One-third of this land is so highly erosive that annual soil loss can be reduced to tolerable levels only under the most restrictive land management practices. More than one-third of U.S. cropland is inherently nonerosive under all management regimes, about half requires conservation management to keep soil loss within tolerable limits, and the remaining 8 percent is so erosive that acceptable soil loss rates cannot be achieved under intensive cultivation.

Do USDA Farm Program Participants Contribute to Soil Erosion? by Katherine H. Reichelderfer. AER-532. April 1985. 84 pp. $3.00. Order SN: 001-019-00383-9 from GPO.

Finds that only about one-third of U.S. cropland with excessive soil erosion rates is operated by farmers who might be influenced to reduce erosion if changes were made in USDA's commodity and soil conservation programs. Present commodity programs may conflict with conservation programs by encouraging cultivation of erosive crops. Efforts to increase the consistency of USDA commodity and conservation programs would contribute little to overcoming the Nation's total erosion problem.

Cropland Rental and Soil Conservation in the United States, by Nelson L. Bills. AER-529. March 1985. 20 pp. $1.50. Order SN: 001-019-00387-1 from GPO.

Data from USDA's Resource Economics Survey challenge the common but not well-substantiated view that farmers are less concerned with erosion on land they rent than on land they own. At the national level, farmers' conservation efforts on rented cropland compare favorably with those on owner-operated cropland.

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Agriculture's Links With U.S. and World Economies, by Alden C. Manchester. AIB-496. September 1985. 60 pp. $1.50. Order SN: 001-019-00409-6 from GPO.

Describes the linkages between farming and the supplying industries and those manufacturing and distributing farm products. Within the last 30 years, the food and fiber system has found itself increasingly reliant on nonfarm industries and increasingly affected by general economic developments, not only within the Nation but from overseas as well.

Improving U.S. Farmland, by Douglas Lewis and Thomas A. McDonald. AIB-482. November 1984. 12 pp. $1.00. Order SN: 001-019-00362-6 from GPO.

A clear, concise account of recent farmland improvements. Farmers invested more than $6.5 billion in improving their land in a recent 3-year period. Those investments, while often made on existing cropland, expanded total U.S. cropland by 9.1 million acres.

Major Uses of Land in the United States: 1982, by H. Thomas Frey and Roger W. Hexem. AER-535. June 1985. 36 pp. $1.25. Order SN: 001-019-00398-7 from GPO.

Discusses the major uses of the Nation's 2,265 million acres of land in 1982: cropland, 469 million acres; grassland pasture and range, 597 million acres; forest land (exclusive of areas in special-purpose uses), 655 million acres; special uses, 270 million acres; and miscellaneous other land, 274 million acres. Changes in cropland and pasture acreages were barely perceptible during 1978-82; forest land (except special use areas) and miscellaneous other land decreased sharply as large acreages in these categories were reclassified as parks, wilderness, and related uses.

UNITED STATES DEPARTMENT OF AGRICULTURE
ECONOMIC RESEARCH SERVICE
1301 NEW YORK AVENUE, N. W.
WASHINGTON, D. C. 20005-4788

Attachment M

DIRECTORY OF FEDERAL LAND MANAGEMENT AGENCY WETLAND CONTACTS

DIRECTORY OF

FEDERAL LAND MANAGEMENT

AGENCY WETLANDS CONTACTS

Prepared by:
Interagency Wetlands Coordinating Body
(1991)

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BACKGROUND

On October 18-20, 1989, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, Forest Service, Soil Conservation Service, Fish and Wildlife Service, Bureau of Land Management, National Park Service, Bureau of Reclamation, and Department of Defense participated in a workshop at Harper's Ferry, West Virginia on "Wise Use and Protection of Federally Managed Wetlands: The Federal Land Management Land Management Agency Role."

The purpose of the three-day workshop was to bring together staff level/middle management from nine Federal agencies to gain a better understanding of the agencies' missions and the constraints of their missions relative to use and protection of wetlands on Federal lands, and to develop ways to collaborate on common issues and concerns. The workshop was organized because there is great potential for improved protection of wetlands through Federal land management agencies. There are about 10 million acres of wetlands under Federal ownership, easements or leases in the lower 48 (29 million acres in Alaska), and there are also many opportunities to restore wetlands on Federal lands.

An Interagency Wetlands Coordinating Body (IWCB) has been established at the Headquarters level to find ways to implement the Harper's Ferry Workshop recommendations. The IWCB produced a video slide presentation entitled "Planning for the Future: Wetlands on Federal Lands" as its first joint effort to improve understanding/communication between the Federal Land Management Agencies. This Wetlands Points of Contact (POC) Directory is the second product of the IWCB.

PURPOSE

The purpose of the directory is to (1) promote a better understanding of the missions of the Federal Land Management Agencies and to (2) enhance communications and cooperation between them at the regional level. The names provided in this directory are points of contact. The points of contact should direct users to program managers within the agency if specific questions or projects are involved.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS (CIVIL WORKS)

CORPS WATER RESOURCES DEVELOPMENT ACTIVITIES

The U.S. Army Corps of Engineers develops, controls, maintains and conserves the Nation's water resources in accordance with the laws and policies established by Congress and the Administration. The Corps carefully considers and seeks to balance the environmental and developmental needs of the nation. Proposed development or action will attempt first to avoid adverse impacts, then minimize or reduce them, and finally compensate for unavoidable effects over the life cycle of the project or action.

WETLANDS MANAGEMENT ON CORPS ADMINISTERED LAND AND WATER

Several Corps Civil Works organizational elements are involved in wetlands management on Corps administered property. The list includes, but is not limited to:

- o Dredging
- o Hydraulics and Hydrology
- o Natural Resources Management
- o Planning
- o Policy
- o Project Operations
- o Regulatory (Section 404)

Dr. William L. Klesch, Chief, Office of Environmental Policy, is the Headquarters coordinator for Civil Works wetlands activities. This directory includes the address and phone number of Dr. Klesch and other points of contact involved in the operation and maintenance of the 11 million acres of land and water entrusted to the Corps. The points of contact are responsible for directing wetlands management inquiries to the responsible Corps element.

The Corps of Engineers is actively involved in wetlands research through the Waterways Experiment Station in Vicksburg, Mississippi. A Wetlands Research Program point of contact is provided in the directory.

HEADQUARTERS, DIRECTORATE OF CIVIL WORKS

Klesch, William Dr., Chief
Office of Environmental Policy
U.S. Army Corps of Engineers
Directorate of Civil Works (CECW-PO)
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Washington, D.C. 20314-1000 FAX - -1163

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Wolcott, Jim, Chief
Natural Resources Section
U.S. Army Corps of Engineers
Directorate of Civil Works (CECW-ON)
20 Massachusetts Avenue N.W. COMM - (202) 272-0247
Washington, D.C. 20314-1000 FAX - -1671

LOWER MISSISSIPPI VALLEY DIVISION

Redmon, Clyde, Chief
Recreation-Resource Management Branch
U.S. Army Corps of Engineers
Lower Mississippi Valley Division (CELMV-CO-R)
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Vicksburg, MS 39180-0080 FAX - -7084

St. Louis District

Marzec, John, Chief
Natural Resources Management Branch
U.S. Army Corps of Engineers
St. Louis District (CELMS-OD-R)
1222 Spruce Street COMM - (314) 331-8622
St. Louis, Missouri 63103-2833 FAX - -8677

Vicksburg District

Woods, Billy J., Chief
Project Resources Management Branch
U.S. Army Corps of Engineers
Vicksburg, Mississippi 39180-0060 COMM - (601) 631-5300
FAX - -7133

MISSOURI RIVER DIVISION

Dunwoody, Don, Chief
Natural Resources Management Branch
U.S. Army Corps of Engineers
Missouri River Division (CEMRD-CO-R)
P.O. Box 103, Downtown Station COMM - (402) 221-7284
Omaha, Nebraska 68101-0103 FAX - -7379

Kansas City District

Lenning, Richard E., Chief
Natural Resources Management Branch
U.S. Army Corps of Engineers
Kansas City District (CEMRK-OD-R)
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Kansas City, Missouri 64106-2896 — FAX - -2730

Omaha District

Schaefer, Theodore H., Chief
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Omaha District (CEMRO-OP-N)
215 North 17th Street — COMM - (402) 221-4139
Omaha, Nebraska 68102-4978 — FAX - -3029

NORTH ATLANTIC DIVISION

Puglese, Pete
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U.S. Army Corps of Engineers
North Atlantic Division (CENAD-CO-OP)
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New York, N.Y. 10007-9998 — FAX - -7392

Baltimore District

Snyder, Don, Chief
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Baltimore District (CENAB-OP-PN)
P.O. Box 1715 — COMM - (301) 962-3693
Baltimore, Maryland 31203-1715 — FAX - -2451

New York District

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New York District (CENAN-PL-E)
26 Federal Plaza — COMM - (212) 264-4662
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Norfolk District

Reid, Andy
Operations and Maintenance Section
U.S. Army Corps of Engineers
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803 Front Street COMM - (804) 441-7641
Norfolk, Virginia 23510-1096 FAX - -7719

Philadelphia District

Drumm, James
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2nd & Chestnut Street COMM - (215) 597-4741
Philadelphia, PA 19106-2991 FAX - -5687

NORTH CENTRAL DIVISION

Loesch, Michael A., Dr.
Outdoor Recreation Planner
U.S. Army Corps of Engineers
North Central Division (CENCD-CO-MO)
536 S. Clark Street COMM - (312) 353-7762
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Buffalo District

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Construction-Operations Division
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1776 Niagara Street COMM - (717) 879-4284
Buffalo, N.Y. 14207-3199 FAX - -4426

Chicago District

Evans, Jim, Chief
Construction-Operations Division
U.S. Army Corps of Engineers
Chicago District (CENCC-CO)
219 South Dearborn Street COMM - (312) 353-6432
Chicago, IL 60604-1797 FAX - -2384

Detroit District

Schloop, Wayne
Chief, Reports Section
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Detroit District (CENCE-CO-OR)
P.O. Box 1027 COMM - (313) 226-6809
Detroit, Michigan 48231-1027 FAX - -2056

Rock Island District

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Natural-Resource Management Branch
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Rock Island District (CENCR-OD-R)
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Clock Tower Building COMM - (309) 788-6361
Ext. 332
Rock Island, Illinois FAX - Ext. 180

St. Paul District

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1421 USPO & Custom House FAX - -0330
180 East Kellog Blvd.
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NEW ENGLAND DIVISION

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424 Trapelo Road COMM - (617) 647-8305
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NORTH PACIFIC DIVISION

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Portland, OR 97208-2870
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Alaska District

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Portland District

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Seattle District

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Seattle District (CENPS-OP-PO)
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Walla Walla District

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Walla Walla District (CENPW-OP-RM)
City-County Airport
Walla Walla, WA 99362-9265
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FAX - -6928

OHIO RIVER DIVISION

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Huntington District

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Louisville District

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Nashville District

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Pittsburgh District

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SOUTH ATLANTIC DIVISION

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Atlanta, GA 30335-6801 FAX - -2613

Charleston District

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Jacksonville District

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Mobile District

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Savannah District

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Wilmington District

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SOUTH PACIFIC DIVISION

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Los Angeles District

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SOUTHWESTERN DIVISION

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Galveston District

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Galveston, TX 77553-1229
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Little Rock District

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Tulsa District

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FAX - -5881

WATERWAYS EXPERIMENT STATION

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Waterways Experiment Station
Environmental Laboratory (CEWES-EL-W)
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Vicksburg, MS 39180-6199

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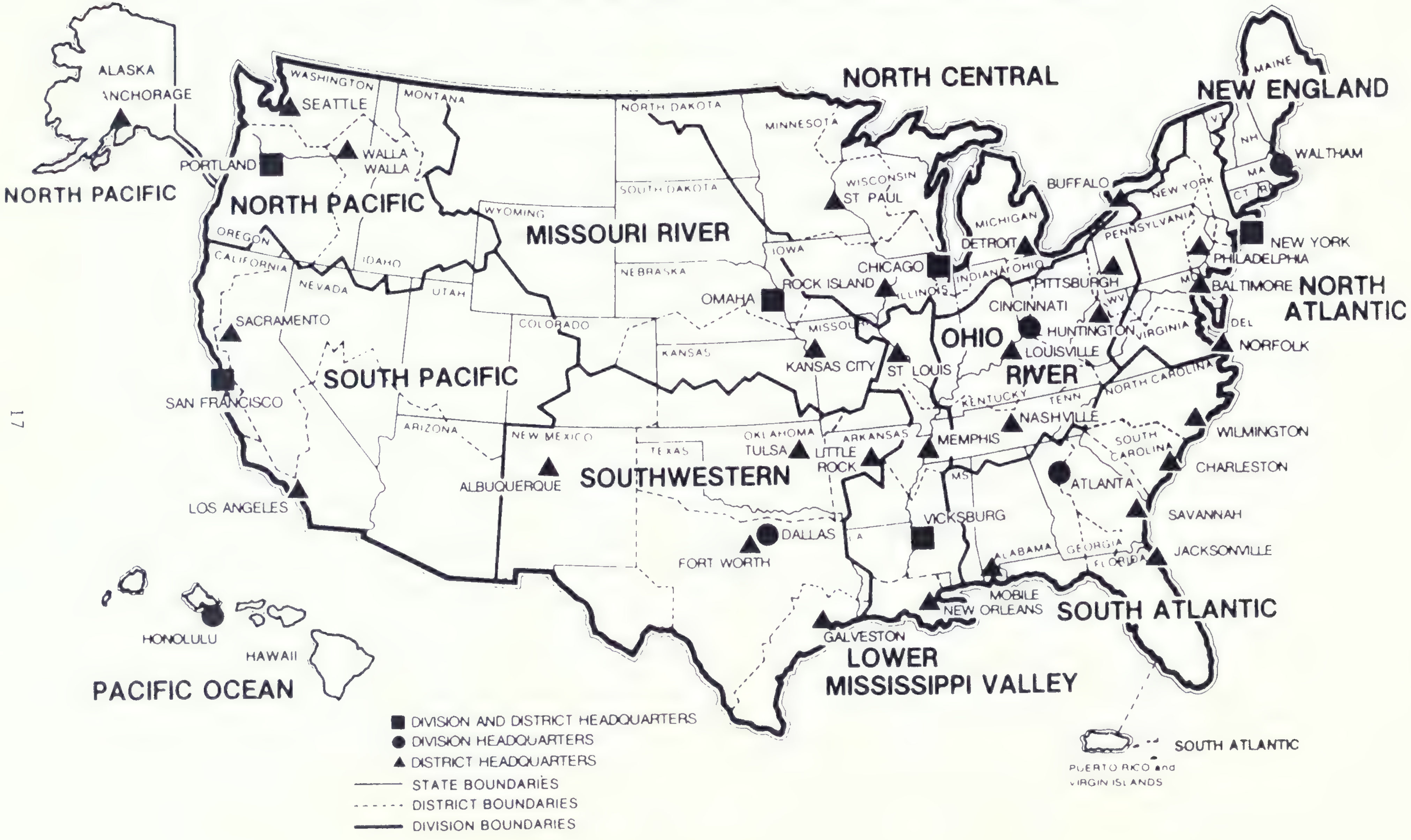
FAC - -3842

Civil Works
Division/District Boundaries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DEPARTMENT OF DEFENSE

WETLANDS PROGRAMS

PROGRAM STRUCTURE

Overall responsibility for DoD's environmental programs is with the Office of the Secretary of Defense (OSD), which issues Department directives, instructions, policy memoranda and other Department-wide requirements.

Each Military Service is responsible for implementing OSD policy. Wetlands management rests with each Service's natural resources division.

Each Service has a different organizational structure. The Army and Air Force both are organized by function through major commands; e.g. the Army's Training and Doctrine (TRADOC) Command, and the Air Force's Tactical Air Command (TAC). The Air Force also has three Regional Civil Engineering offices, which are responsible for intergovernmental coordination. The Navy is organized regionally by Engineering Field Divisions. The Marine Corps, a part of the Navy, manages its natural resources programs directly from Headquarters.

Day-to-day operations are normally conducted by each installation's natural resources manager, through its engineering office.

Land acquisition and disposal, and related actions such as conservation easements, are assigned separately within DoD to each component's real estate division. A Base Realignment and Closure (BRAC) office oversees activities in this area.

WETLANDS PROGRAMS:

1. Resources Management: DoD manages its nearly 25 million acres of military lands for multiple use and sustained yield. Integrated natural resources management plans are required for all lands under DoD control.

2. Agreements: DoD enhances its wetlands protection program through interagency and private agreements. For example, the Fish and Wildlife Service (FWS) is updating or preparing new fish and wildlife management plans for 15 DoD installations, in conjunction with a cooperative agreement under the North American Waterfowl Management Plan. A 1988 agreement with The Nature Conservancy enabled Vandenberg AFB, California, to plan, produce, and implement a coastal dune management plan for the entire 55 mile Nipomo/Vandenberg dune and wetland complex.

3. Creation/Enhancement: DoD is using public and private ventures to promote wetlands protection and enhancement. For example, a recent wetlands creation project at the Naval Station in Annapolis involved such diverse groups as the Navy Seabees, a local community college, private industry, the Chesapeake Bay Foundation, and a center for developmentally disabled adults. The Air Force, working in cooperation with Ducks Unlimited, is creating new wetlands at Edwards AFB, California, to divert waterfowl away from a major landing strip for the Space Shuttle and experimental aircraft. Expanded guidance for DoD's volunteer and partnership program is being developed, and should be available early in 1991.

4. Inventory: The Army's Intergrated Training Area Management (ITAM) program was designed to identify baseline resource conditions and monitor ecological changes so that training impacts are minimized. The FWS is preparing an inventory of the Navy's wetlands.

5. Land Disposition: Many DoD installations will be affected by base realignment and closure decisions. DoD is exploring the feasibility of using conservation easements to protect some of these lands.

DEPARTMENT OF DEFENSE

Natural Resources Management

Office of the Secretary of Defense

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Department of the Army

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Edna Barber
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Headquarters

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Bolling AFB
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Regional Environmental Offices

The Air Force is currently reorganizing their regional offices. Three regional environmental offices report to HQ U.S. Air Force Air Staff. Regional boundaries have not been established.

Eastern Office
77 Forsyth Stret, SW Suite 291
Atlanta, GA 30335-6801 COMM: (404) 331-6776

Central Office
1114 Commerce Street
Dallas, TX 75242 COMM: (214) 653-3351

Western Office
630 Sansome Street Room 1316
San Francisco, CA 94111 COMM: (415) 556-6439

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Air Force Logistics Command
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Ernest Lagimoniere
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Alaskan Air Command
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Pacific Air Forces
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Albert Loftin
Chief, Natural Resources
Air Force District of Washington
Bolling AFB
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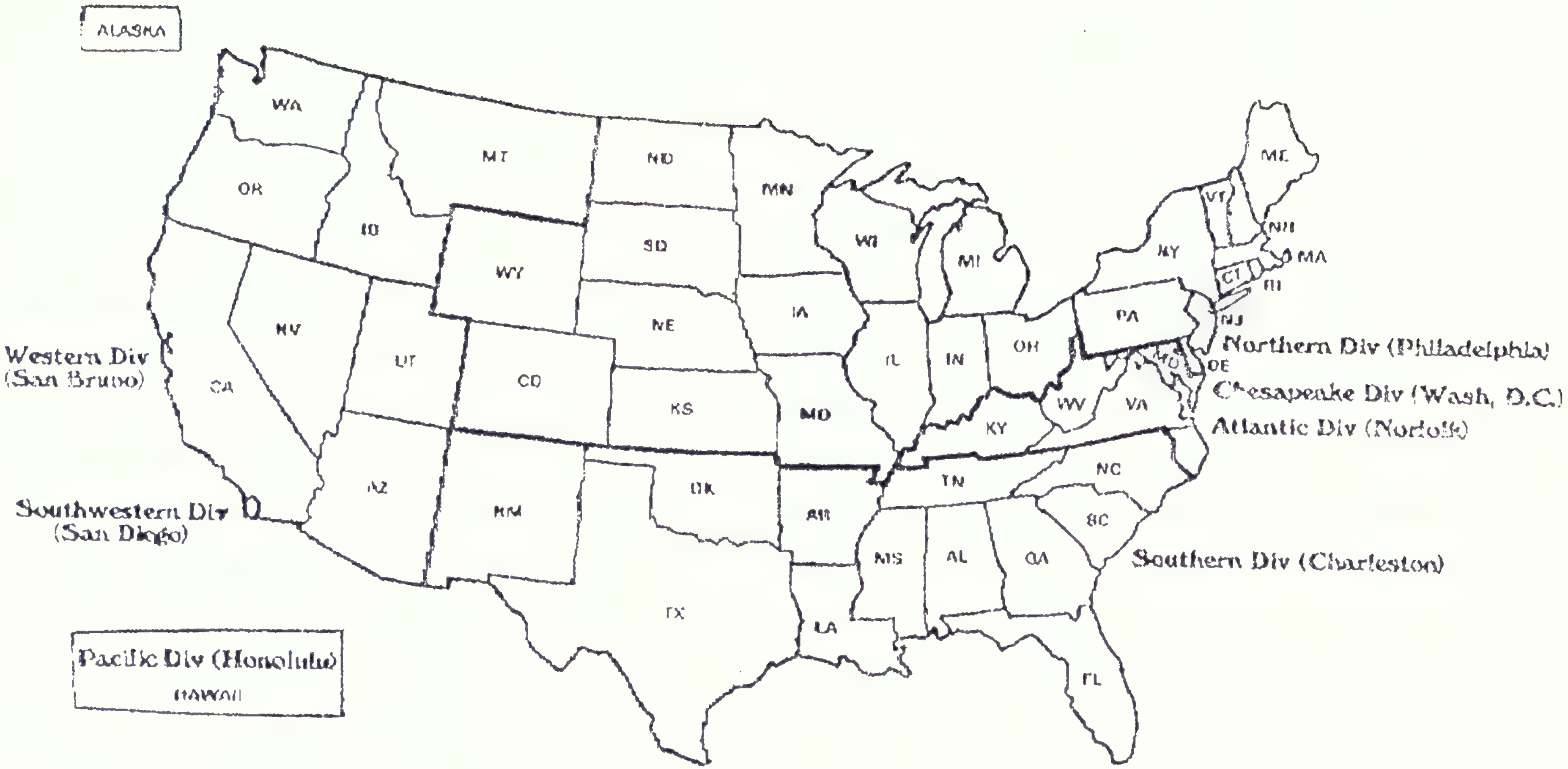
ALASKA
Western Div (San Bruno)
Southwestern Div (San Diego)
Pacific Div (Honolulu)
HAWAII
Northern Div (Philadelphia)
Chesapeake Div (Wash, D.C.)
Atlantic Div (Norfolk)
Southern Div (Charleston)
WA
OR
CA
ID
NV
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GA
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SC
NC
VA
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NY
MD
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RI
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VT
NH
ME

Field Divisions of Naval Facilities Engineering Command

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U.S. DEPARTMENT OF AGRICULTURE

FOREST SERVICE

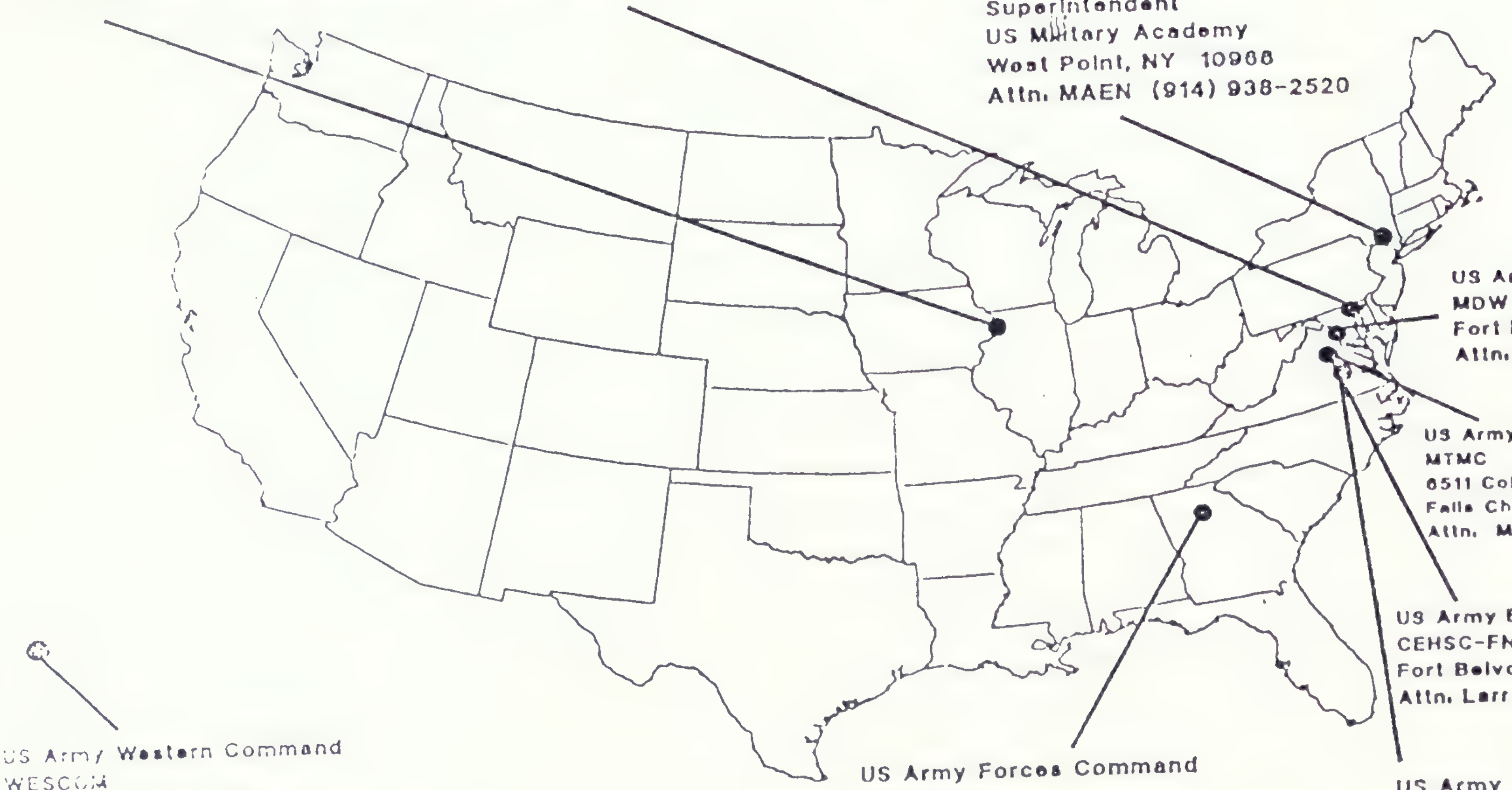
WETLANDS AND RIPARIAN ACTIVITIES

The Forest Service manages wetland and riparian habitat on 191 million acres of public land. These lands are administered by nine Regional Offices. These offices also provide assistance to State Foresters. Research on riparian and wetlands is conducted by the eight Experiment Stations. The contacts listed can identify other specific people and projects dealing with riparian areas and wetlands.

The National Forest System manages a diverse variety of Wetland and Riparian ecosystems from Puerto Rico to Alaska. These areas are managed according to prescriptions and standards and guidelines in Forest Plans. The Forest Service's goal is to provide for healthy, diverse, and productive ecosystems that will sustain a variety of public benefits now and in the future. The National Forest System and State and Private Forestry Coordinators can provide information on outreach, agreements, inventory, mapping, earth science, ecology, status and trends monitoring, management, restoration, protection and conservation, enhancement, creation and mitigation, land acquisition, activities under the North American Waterfowl Management Plan, recreation, land use, environmental protection, geomorphology, hydrology planning, delineation, program oversight, and evaluation. The research contact can provide information on ongoing and planned research in wetland and riparian areas.

P.O.C. for HQ & Major Commands Location

US ARMY
ENGINEERING & HOUSING
SUPPORT CENTER



US Army Materiel Command
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Rock Island, IL 61299-6000
Attn. Rick Clewell (309) 782-8252

Chief, National Guard Bureau
Aberdeen Proving Ground, MD 21010-5420
Attn. Paul Strider (301) 671-1825

Superintendent
US Military Academy
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Attn. MAEN (914) 938-2520

US Army Military District of Washingt
MDW
Fort McNair, Washington DC 20319-5
Attn. Edna Barber (202) 475-2793

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NOTE: **Washington Office phone prefix changes to 205 beginning August 1, 1991.**

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USDA FOREST SERVICE - WETLAND CONTACTS

REGIONAL CONTACTS

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(COM) 406-329-3112

REGION 2 (COLORADO, EASTERN WYOMING, KANSAS, NORTH & SOUTH DAKOTA, NEBRASKA)

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(COM) 303-236-9526

REGION 3 (ARIZONA, NEW MEXICO, OKLAHOMA PANHANDLE, WEST TEXAS)

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REGION 6 (OREGON, WASHINGTON)

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(COM) 503-326-2931

REGION 8 (TEXAS, LOUISIANA, ARKANSAS, MISSISSIPPI, ALABAMA, GEORGIA, FLORIDA, NORTH & SOUTH CAROLINA, KENTUCKY, TENNESSEE, VIRGINIA, PUERTO RICO, OKLAHOMA, VIRGIN ISLANDS)

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(COM) 404-347-7213

REGION 9 (MINNESOTA, WISCONSIN, MICHIGAN, ILLINOIS, MISSOURI, INDIANA, OHIO, PENNSYLVANIA, WEST VIRGINIA, VERMONT, NEW HAMPSHIRE, NEW YORK, DELAWARE, CONNECTICUT, IOWA MAINE, MARYLAND, MASSACHUSETTS, MICHIGAN NEW JERSEY, RHODE ISLAND)

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(COM) 414-291-3297

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RESEARCH STATION - WETLAND CONTACTS, continued

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RESEARCH STATION - WETLAND CONTACTS, continued

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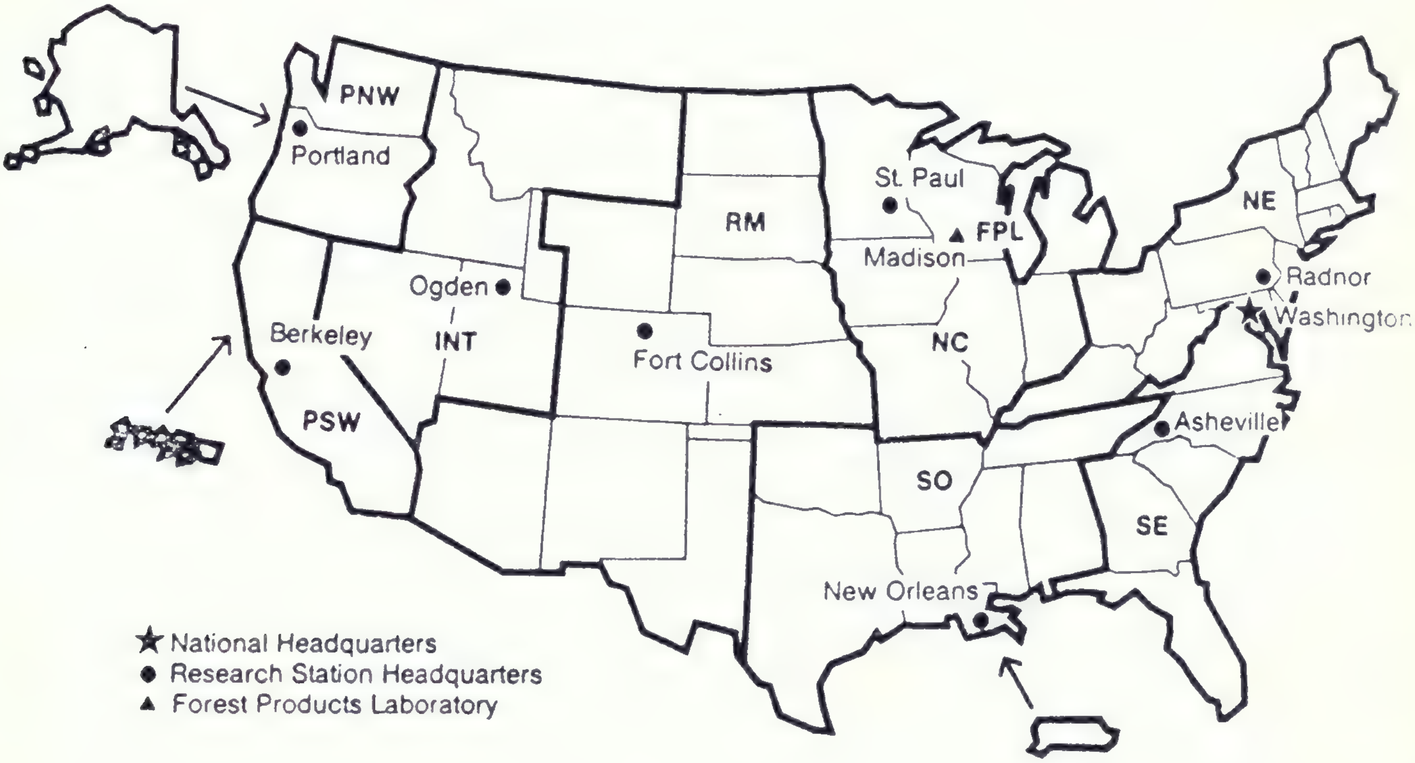
(COM) 504-589-3003

Forest Service
U.S. Department of Agriculture

Research


PNW
Portland
PSW
Berkeley
INT
Ogden
RM
Fort Collins
NC
St. Paul
FPL
Madison
NE
Radnor
Washington
SO
New Orleans
SE
Asheville
★ National Headquarters
● Research Station Headquarters
▲ Forest Products Laboratory

National Headquarters

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P.O. Box 96090
Washington, DC 20090-6090
202-447-3957

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U.S. Department of Agriculture
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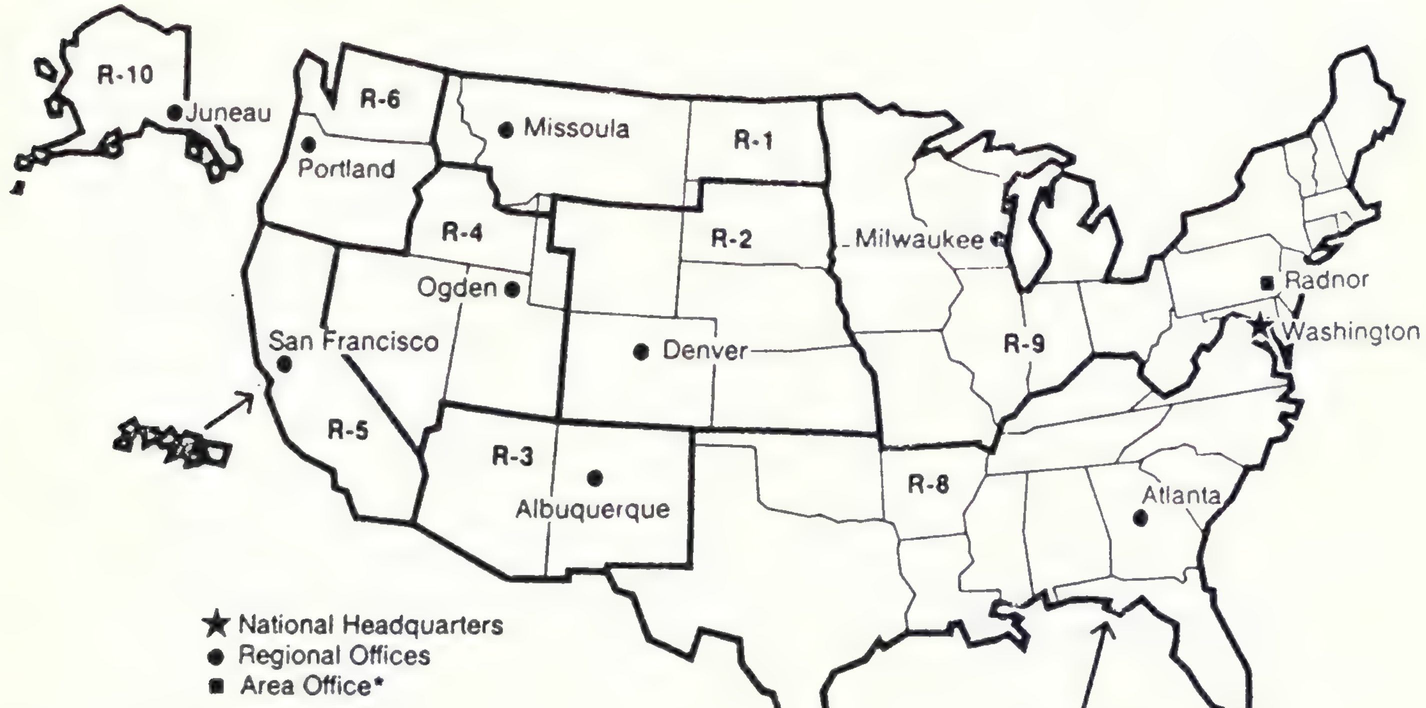
One Gifford Pinchot Drive
Madison, WI 53705-2398
608-264-5600

Forest Service
U.S. Department of Agriculture

National Forest System Regional Offices
State and Private Forestry Area Office*


R-10
Juneau
R-6
Portland
Missoula
R-1
R-4
R-2
Milwaukee
Ogden
Radnor
Washington
San Francisco
Denver
R-9
R-5
R-3
R-8
Albuquerque
Atlanta
★ National Headquarters
● Regional Offices
■ Area Office*

*In other regions, State and Private
Forestry activities are directed
from Regional Offices.

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303-236-9431

Forest Service, USDA
Southwestern Region (R-3)
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Albuquerque, NM 87102
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Forest Service, USDA
Intermountain Region (R-4)
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Forest Service, USDA
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Forest Service, USDA
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Northeastern Area— S&PF
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FISH AND WILDLIFE SERVICE
WETLANDS PROGRAMS

BACKGROUND

The U.S. Fish and Wildlife Service's mission is to conserve, protect, and enhance fish, wildlife, and their habitats for the continuing benefit of the American people. Primary responsibilities are for migratory birds, endangered species, freshwater and anadromous fisheries, and certain marine mammals. The Service has eight regional offices, including one for research, a headquarters in Washington, D.C. and a large number of field units, including national wildlife refuges, national fish hatcheries, research laboratories, and a nationwide network of law enforcement agents.

The Service manages more than 450 national wildlife refuges to provide habitat for migratory birds, endangered species, and other wildlife and wildlife-oriented public recreation. It also sets migratory bird hunting regulations, leads the national effort to protect and restore endangered and threatened animals and plants in the United States and other countries, and administers Federal grant programs for State fish and wildlife restoration programs. Through its fishery resources program, the Service operates national fish hatcheries and conducts programs to conserve and restore nationally significant fisheries and assists Indian tribes in managing their fisheries.

Service biologists evaluate the effects of development projects on fish and wildlife resources and recommend ways to mitigate harmful impacts. The agency's research program provides scientific data needed to conserve and manage fish and wildlife resources. The Service is also charged with controlling wildlife damage to crops and livestock and eliminating wildlife hazards to public health and safety. Law enforcement agents enforce Federal laws protecting migratory birds, endangered species, fisheries, marine mammals, and other species.

In all these activities, the Service works closely with States, other Federal agencies, and Indian tribes, and the private sector.

WETLANDS PROGRAMS

The Service manages over 90 million acres of land and water on over 450 units comprising the National Wildlife Refuge System. Nearly all units contain managed wetlands of some form, and almost 40 percent of the Refuge System acreage is considered to be wetlands. Most of the wetlands on refuges have been restored or enhanced in the last twenty years, although active projects are still much in evidence, particularly on recent acquisitions. An active land acquisition program targets high priority wetlands for protection and restoration/enhancement as required.

The Service has mapped the wetlands for over 60 percent of the United States through its National Wetlands Inventory program, and the project is scheduled for completion by 1998 (Lower 48 States). Nearly one-fifth of Alaska has also been mapped.

Service personnel, operating under several authorities, review the activities of other agencies that may affect wetlands, review permit applications and offer technical assistance on wetland matters. Service personnel are also actively working with Department of Agriculture agencies and private landowners to restore wetlands on private lands.

Partnerships are being developed with other Federal, State and local agencies to conserve wetlands under the North American Waterfowl Management Plan (NAWMP). This far reaching program targets not only projects in the United States, but also Canada and Mexico.

The Service recently (July, 1990) completed a Wetlands Action Plan in response to the President's call for a no-net-loss of wetlands in the United States. The three-pronged action plan calls for renewed emphasis in the areas of wetland protection; wetlands restoration, enhancement, and management; and wetlands research, information, and education. A variety of future strategies are outlined in the action plan through its multi-year approach.

USDI FISH AND WILDLIFE SERVICE - WETLAND CONTACTS

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-Assistant Director - Fish and Wildlife Enhancement (2)
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REGION 1

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Assistant Regional Director - Fish and Wildlife Enhancement (2)
1002 Northeast Holladay Street FTS: 429-6159
Portland, Oregon 97232-4181 COMM: (503) 231-6159

REGION 2

Assistant Regional Director - Refuges and Wildlife (1)
P.O. Box 1306 FTS: 474-1829
Albuquerque, New Mexico 87103 COMM: (505) 766-1829

Assistant Regional Director - Fish and Wildlife Enhancement (2)
P.O. Box 1306 FTS: 474-2324
Albuquerque, New Mexico 87103 COMM: (505) 766-2324

REGION 3

Assistant Regional Director - Refuges and Wildlife (1)
Federal Building, Fort Snelling FTS: 725-3507
Twin Cities, Minnesota 55111 COMM: (612) 725-3507

Assistant Regional Director - Fish and Wildlife Enhancement (2)
Federal Building, Fort Snelling FTS: 725-3510
Twin Cities, Minnesota 55111 COMM: (612) 725-3510

REGION 4

Assistant Regional Director - Refuges and Wildlife (1)
Richard B. Russell Federal Building
75 Spring Street, SW FTS: 841-0833
Atlanta, Georgia 30303 COMM: (404) 331-0833

Assistant Regional Director - Fish and Wildlife Enhancement (2)
Richard B. Russell Federal Building
75 Spring Street, SW FTS: 841-6343
Atlanta, Georgia 30303 COMM: (404) 331-6343

REGION 5

Assistant Regional Director - Refuges and Wildlife (1)
One Gateway Center, Suite 700 FTS: 829-9222
Newton Corner, Massachusetts 02158 COMM: (617) 965-9222

Assistant Regional Director - Fish and Wildlife Enhancement (2)
One Gateway Center, Suite 700 FTS: 829-9217
Newton Corner, Massachusetts 02158 COMM: (617) 965-9217

REGION 6

Assistant Regional Director - Refuges and Wildlife (1)
Box 25486, Denver Federal Center FTS: 776-8145
Denver, Colorado 80225 COMM: (303) 236-8145

Assistant Regional Director - Fish and Wildlife Enhancement (2)
Box 25486, Denver Federal Center FTS: 776-8189
Denver, Colorado 80225 COMM: (303) 236-8189

REGION 7

Assistant Regional Director - Refuges and Wildlife (1)
1011 East Tudor Road FTS: 869-3545
Anchorage, Alaska 99503 COMM: (907) 786-3545

Assistant Regional Director - Fish and Wildlife Enhancement (2)
1011 East Tudor Road FTS: 869-3544
Anchorage, Alaska 99503 COMM: (907) 786-3544

REGION 8

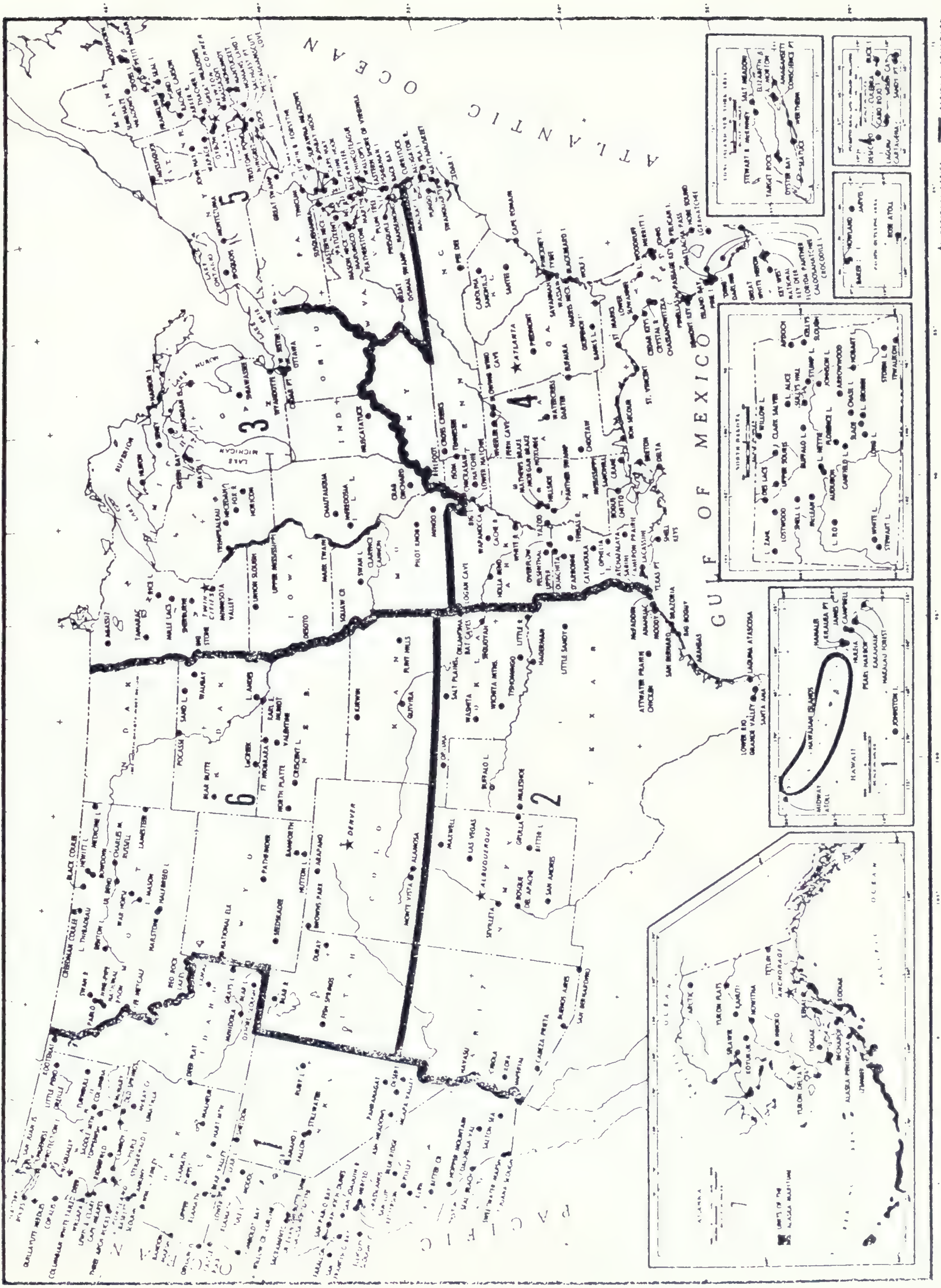
Regional Director - Research and Development (3)
Fish and Wildlife Service
Interior Building
1849 C St. NW
Mail Stop 725 Arlington Square FTS: 921-1801
Washington, D.C. 20240 COMM: (703) 358-1801

(1) Land acquisition, wetland management, NAWMP, Refuges, WPA's
(2) Regulations/Permits, Inventory/Mapping, Technical Assistance
(3) Research, Technology Transfer

UNITED STATES
DEPARTMENT OF THE INTERIOR

NATIONAL WILDLIFE REFUGE SYSTEM

UNITED STATES
FISH AND WILDLIFE SERVICE


ATLANTIC OCEAN
GULF OF MEXICO
PACIFIC
LAKE MICHIGAN
LAKE SUPERIOR
LAKE ONTARIO
DENVER
ATLANTA
ALBUQUERQUE
TWIN CITIES
ANCHORAGE
ALASKA
HAWAII
HAWAIIAN ISLANDS
MIDWAY ATOLL
NORTH DAKOTA
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★ REGIONAL OFFICE
REGIONAL BOUNDARY

NATIONAL PARK SERVICE

The mission of the National Park Service (NPS) is to conserve, preserve, and manage resources in units of the National Park System so that they remain unimpaired for the future and for the enjoyment by people, today and in future generations.

The NPS carries out natural, cultural, and recreational resource inventory and research programs which have Regional and cross-Agency scope, such as:

Wild and Scenic Rivers Program,
National Natural Landmarks,
National Historic Landmarks,
National Register of Historic Places,
Statewide Comprehensive Outdoor Recreational Planning (SCORP),
Land and Water Conservation Fund Grants-in-Aid,
Rivers and Trails Conservation Assistance,
National Trails System,
Biosphere Reserves/Man in the Biosphere, and
World Heritage Sites.

NPS Regional Water Coordinators and representatives from various Washington Offices are responsible for a wide range of activities primarily associated with restoration, enhancement, management, inventory, research, and outreach programs directly or indirectly involving wetlands protection. Representatives from the Washington Office deal with the Nationwide or Systemwide perspective for those programs listed below:

Research and General Program Information

Pam Matthes
Water Resources Division
National Park Service
P.O. Box 37127
Washington, D.C. 20013-7127
FTS: 268-4639
COMM:(202) 208-4639

Outreach

Mike Watson
Interpretation Division
National Park Service
P.O. Box 37127
Washington, D.C. 20013-7127
FTS: 523-5270
COMM: (202) 523-5270

Washington Office (continued)

Agreements

William Spitzer
Recreation Resources Assistance Division
National Park Service
P.O. Box 37127
Washington, D.C. 20013-7127
FTS: 343-3780
COMM: (202) 343-3780

Management, Legal Framework, and Wetland Use

Joel Wagner
Water Resources Division
National Park Service
12795 West Alameda Parkway
P.O. Box 25287
Denver, Colorado 80225-0287
FTS: 327-2955
COMM: (303) 969-2955

Water Quality/Water Quantity

Stan Ponce
Water Resources Division
National Park Service
Federal Building, Room 353
301 S. Howes Street
Fort Collins, Colorado 80521
FTS/COMM: (303) 221-5341

NPS Regional Water Resource Coordinators are responsible for a wide range of wetlands programs conducted within their respective Regions. The following program areas are covered in each Region by these coordinators: (1) management goals and objectives; (2) current park resource status; (3) land use plans; (4) budget and staffing requirements; (5) training schedules; and, (6) wetlands programs conducted at specific parks. Refer to the maps indicating the States covered by each Regional Office.

Alaska Regional Office

Gary Vequist
National Park Service
2525 Gambell Street, Room 107
Anchorage, Alaska 99503-2892
FTS/COMM: (907) 257-2570

Mid-Atlantic Regional Office (MAR)

John Karish
National Park Service
209B Ferguson Building
Unversity Park, PA 16802
FTS/COMM: (814) 865-7974

Midwest Regional Office (MWR)

Ronald Hiebert
National Park Service
1709 Jackson Street
Omaha, NE 68102
FTS/COMM: (402) 221-3438

National Capital Region (NCR)

Richard Hammerschlag
National Park Service
1100 Ohio Drive, S.W.
Washington, D.C. 20242
FTS/COMM: (202) 342-1443

North Atlantic Region (NAR)

Charlie Roman
National Park Service
University of Rhode Island
Narragansett Bay Campus
Narragansett, RI 02882-1197
COMM: (401) 792-6885

Pacific Northwest Region (PNWR)

Shirley Clark
National Park Service
83 South King Street, Suite 212
Seattle, WA 98104
FTS: 399-4235
COMM: (206) 442-4176

Rocky Mountain Region (RMR)

Ron Hermance
National Park Service
P.O. Box 25287
Denver, Colorado 80225-0287
FTS: 327-2654
COMM: (303) 969-2654

Southeast Region (SER)

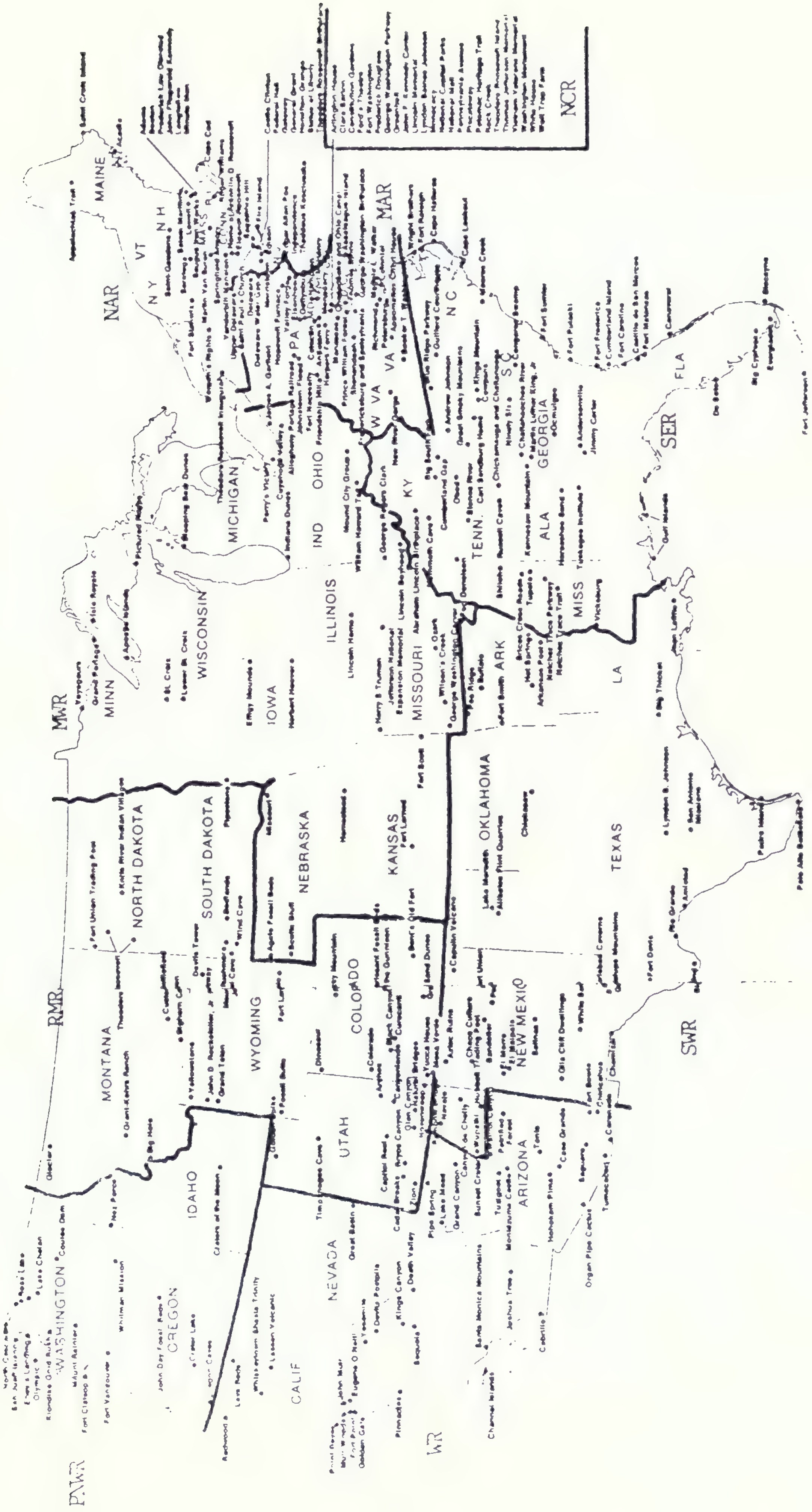
Trish Patterson
National Park Service
75 Spring Street, S.W.
Atlanta, GA 30303
FTS: 841-4916
COMM: (404) 331-4916

Southwest Region (SWR)

Keith Yarborough
National Park Service
P.O. Box 728
Santa Fe, NM 87504-0728
FTS/COMM: (505) 988-6870

Western Region (WR)

Mietek Kolipinski
National Park Service
450 Golden Gate Avenue
P.O. Box 36063
San Francisco, CA 94102
FTS/COMM: (415) 556-4968


PNWR
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OREGON
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MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
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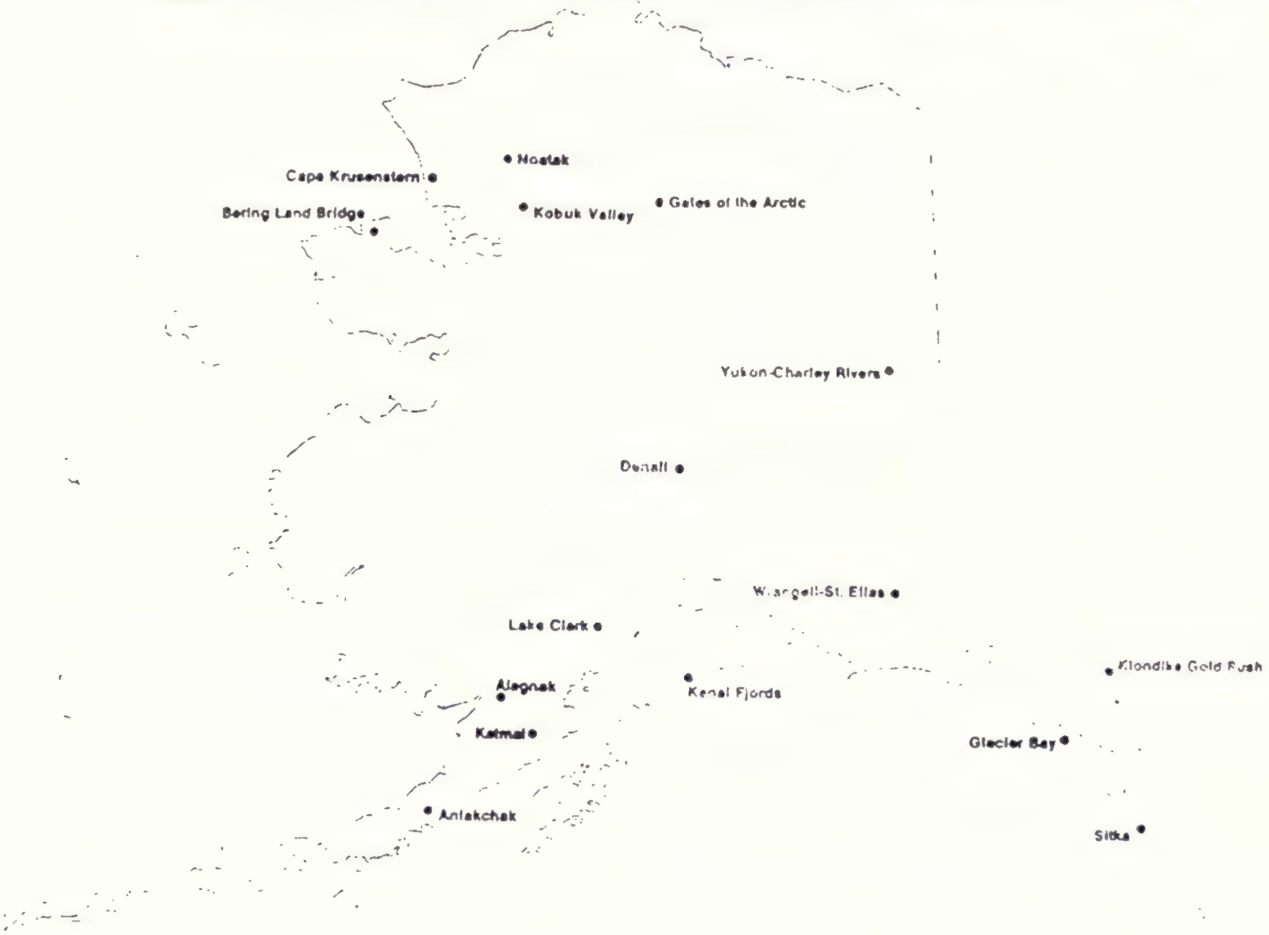
Yellowstone
Grand Teton
Glacier
Mount Rainier
Olympic
Crater Lake
Yosemite
Sequoia
Kings Canyon
Death Valley
Grand Canyon
Zion
Bryce Canyon
Mesa Verde
Rocky Mountain
Carlsbad Caverns
Big Bend
Everglades
Great Smoky Mountains
Mammoth Cave
Isle Royale
Acadia
Shenandoah
Hot Springs
Badlands
Wind Cave
Redwood
Lassen Volcanic
Joshua Tree
Petrified Forest
Voyageurs
Lincoln Home
Jefferson National Expansion Memorial
Statue of Liberty
Independence
Gettysburg
Cape Hatteras
Cape Cod
Vicksburg
Lyndon B. Johnson
San Antonio Missions
Padre Island
Dinosaur
Arches
Canyonlands
Capitol Reef
Wright Brothers
Jimmy Carter
Fort Jefferson
Biscayne
Saint Croix Island

The National Park System (continued)

Alaska

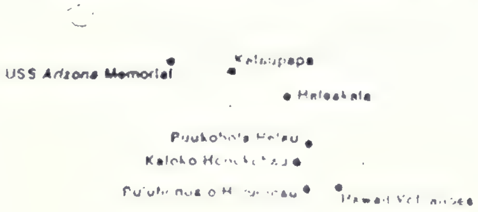

Noatak
Cape Krusenstern
Bering Land Bridge
Kobuk Valley
Gates of the Arctic
Yukon-Charley Rivers
Denali
Wrangell-St. Elias
Lake Clark
Klondike Gold Rush
Alagnak
Kenai Fjords
Katmai
Glacier Bay
Aniakchak
Sitka

Seven national park areas in Alaska have adjoining national preserves, counted as separate units of the National Park System. They are: Aniakchak, Denali, Gates of the Arctic, Glacier Bay, Katmai, Lake Clark, and Wrangell-St. Elias.

Guam

War in the Pacific

Hawaii


USS Arizona Memorial
Kalaupapa
Haleakala
Puukohola Heiau
Kaloko-Honokohau
Puuhonua o Honaunau
Hawaii Volcanoes

Puerto Rico and the Virgin Islands

San Juan
Virgin Islands
Buck Island Reef
Christiansted

BUREAU OF LAND MANAGEMENT

RIPARIAN - WETLANDS ACTIVITIES

Bureau of Land Management (BLM) State riparian-wetlands coordinators are wetland-riparian responsible for a wide range of activities primarily associated with the maintenance, restoration, improvement, or expansion of areas. The primary objective for these actitivies is to achieve a healthy and productive ecological condition that will maintain long-term benefits. Specifically, the State coordinators are required to coordinate the implementation of Statewide management strategies that include, but are not limited to the following general areas:

- Management goals and objectives
- State management policy
- Present resource status - acreages/miles by ecological/functional condition
- Benefits/values
- Land use plans
- Inventory, monitoring and evaluation schedules
- Budget and staffing requirements
- Traning schedules
- Outreach plans
- Management accomplishments/results
- Program specific multiple use approaches to riparian-wetland management

Contacts - BLM

Headquarters Office

Donald D. Waite (222)
or Ronnie D. Clark
1849 C Street, N.W.
Premier Bldg., Room 909 FTS: 653-9210
Washington, D.C. 20240 COMM: (202) 653-9210

Dwight Hovland
Alaska State Office (933)
222 W. 7th Avenue #13 COMM: (907) 271-3356
Anchorage, AK 99513-7599

Neal Middlebrook
or Jack Williams (240)
1849 C Street, N.W.
Premier Building, Room 906   FTS: 653-9202
Washington, D.C. 20240   COMM: (202)653-9202

Regional Contacts

Ron Hooper
Arizona State Office (932)   FTS: 261-5509
3707 N. 7th Street   COMM: (602) 640-5509
P.O. Box 16563
Phoenix, AZ 85011

Mark Blakeslee
California State Office (932)   FTS: 461-4725
2800 Cottage Way   COMM: (916) 978-4725
E-2841
Sacramento, CA 95825-1889

Brenda Mitchell   (Includes lands in Kansas)
Colorado State Office (933)   FTS: 554-3724
2850 Youngfield Street   COMM: (303) 554-3724
Lakewood, CO 80215

Mike Mescher   (Includes all states east of the 100th Meridan)
Eastern States Office (960)
350 S. Pickett Street   COMM: (703) 461-1307
Alexandria, VA 22304

Allan Thomas
Idaho State Office (931)   FTS: 554-1835
3380 Americana Terrace   COMM: (208) 334-1835
Boise, ID 83706

Dan Hinckley   (Includes lands in North Dakota and South Dakota
Montana State Office (931)
222 N. 32nd Street   FTS: 588-7928
P.O. Box 36800   COMM: (406) 255-2928
Billings, MT 59107

Osborn Casey
Nevada State Office (931)   FTS: 469-6473
850 Harvard Way   COMM: (702) 785-6473
P.O. Box 12000
Reno, NV 85920-0006

Andy Dimas (Includes lands in
New Mexico State Office (931) Oklahoma)
South Federal Place FTS: 476-6227
P.O. Box 1449 COMM: (505) 988-6231
Santa Fe, NM 87504-1449

Bill Brookes (Includes lands in
Oregon State Office (932) Washington)
825 NE Multnomah Street FTS: 392-7054
P.O. Box 2965 COMM: (503) 231-2253
Portland, OR 97208

Jerry Farringer
Utah State Office (932) FTS: 581-4183
324 South State Street, Suite 301 COMM: (801) 539-4058
Salt Lake City, UT 84111-2303

Mark Gorges (includes lands in
Wyoming State Office (932) Nebraska)
2515 Warren Avenue FTS: 329-6082
P.O. Box 1828 COMM: (307) 772-2095
Cheyenne, WY 82003

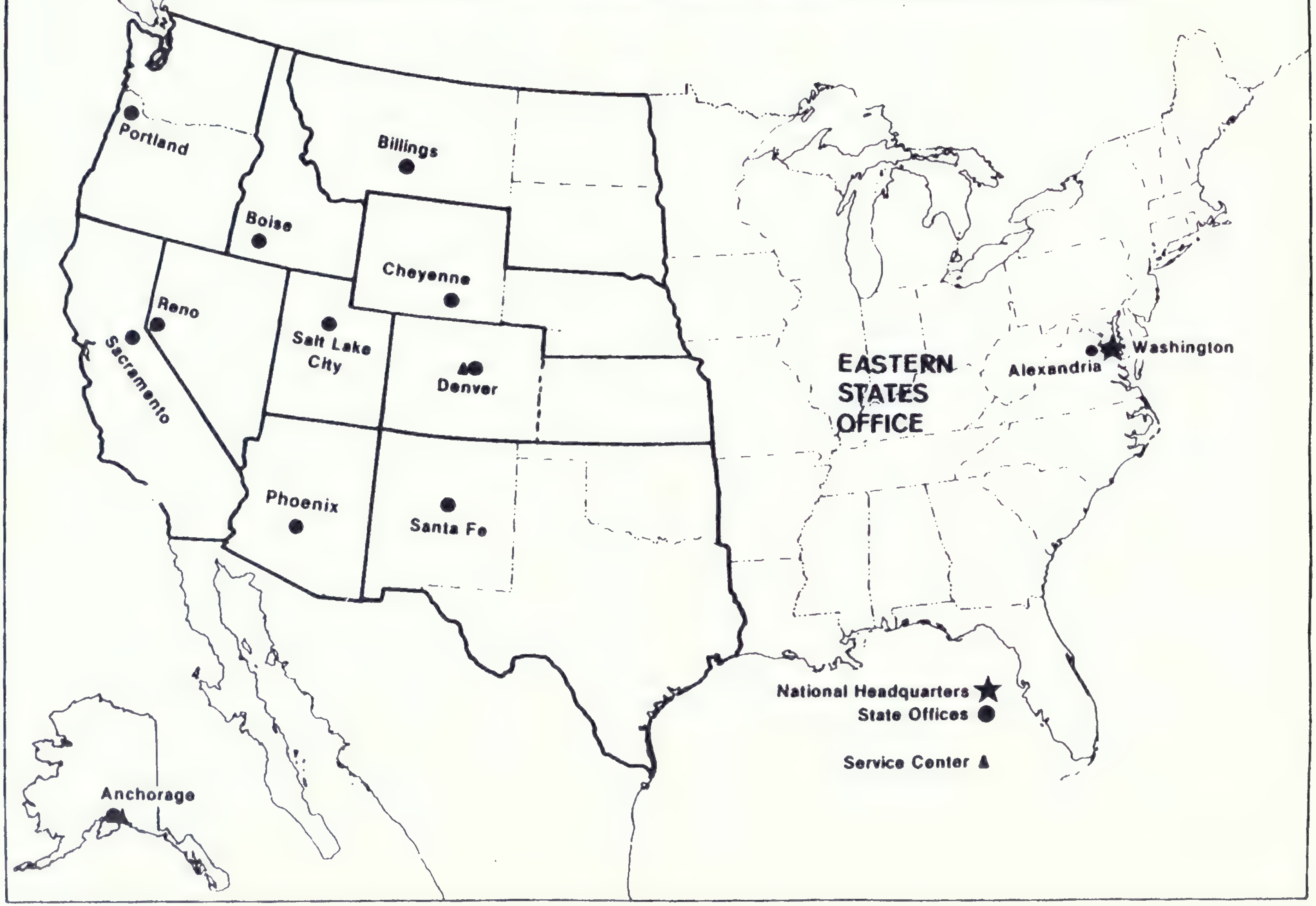
Technical documents can be obtained from:

Bureau of Land Management
Service Center
Printed Materials Distribution Section
Building 50, Denver Federal Center FTS: 776-7637
P.O. Box 25047 COMM: (303) 236-7637
Denver, CO 80225-0047

Training courses and videos can be obtained from:

Dann Tippy
Bureau of Land Management
Phoenix Training Center
5050 N. 19th Avenue FTS: 261-2651
Suite 300 COMM: (602) 640-2651
Phoenix, Arizona 85015

BUREAU OF LAND M AGEMENT FIELD OFFICES


Portland
Billings
Boise
Cheyenne
Reno
Salt Lake City
Sacramento
Denver
EASTERN STATES OFFICE
Alexandria
Washington
Phoenix
Santa Fe
National Headquarters ★
State Offices ●
Service Center ▲
Anchorage

EPA WETLANDS DIVISION
OFFICE OF WETLANDS, OCEANS, AND WATERSHEDS
HEADQUARTERS, WASHINGTON, D.C.

EPA implements legislation, largely regulatory, directed to protecting human health and the environment. EPA program address a number of environmental concerns including air quality, hazardous waste, and water quality. Under the Clean Water Act the U.S. Environmental Protection Agency has the authority to implement a variety of programs to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

EPA implements a variety of programs to protect water quality by working with states, industry and a broad variety of interest groups to regulate and reduce the impacts of ocean dumping, end of pipe discharges from industry and sewage treatment plants, over land discharges such as nonpoint sources and stormwater, and dredge and fill activities. Such activities have a profound impact on the Nation's waters and their adjoining floodplains.

EPA has adopted, the goal of no net loss of wetlands and is committed to protecting, enhancing, and restoring the Nation's wetlands. The Wetlands Division in the Office of Wetlands, Oceans, and Watershed protects wetlands through both traditional regulatory programs and its newer non-regulatory initiatives.

Section 404 of the Clean Water Act regulates the discharge of dredge and fill materials into Waters of the U.S. These include rivers, streams and harbors as well as special aquatic sites such as wetlands. The program is carried out jointly by EPA and the Army Corps of Engineers.

EPA's nonregulatory activities focus on advancing the President's no net loss goal, by encouraging planning for protection and management of wetlands, promoting private stewardship, providing better information, encouraging wetlands restoration and creation, and financing wetlands protection through activities such as a newly established state wetlands grant program.

The organization/functions of the Wetlands Division within the Office of Wetlands, Oceans and Watersheds is as follows:

- **Division Director** - Responsible for general program management and administrative support.

Contact:	John Meagher, Director	COMM: FTS	(202) 475-7791
		FAX:	(202) 475-8000
	Suzanne Schwartz, Deputy Director	COMM: FTS	(202) 475-7799
		FAX:	(202) 475-6146

- **Wetlands & Aquatic Resources Regulatory Branch** (WARRB) - Responsible for all section 404 regulatory activities except State program. Under WARRB are:

Contact: Greg Peck, Acting Chief COMM: FTS (202) 475-7799
FAX: (202) 475-6146

- **The Enforcement and Regulatory Policy Staff** which is responsible for the development of policy, regulations, and guidance; general section 404 program development, management and regional assistance.

Contact: Cliff Rader, Acting Chief COMM: FTS (202) 475-7799
FAX: (202) 475-6146

- **The Elevated Cases Team** which is responsible for handling of elevated cases under Section 404(c) or 404(q); development of related guidance and case-related assistance to the Regions.

Contact: Will Garvey, Acting Chief COMM: FTS (202) 475-7799
FAX: (202) 475-6146

- **Wetlands Strategies and State Programs Branch** (WSSPB) - Responsible for State program activities and all other (Non-404) activities. Under WSSPD are:

Contact: Branch Chief (vacant) COMM: FTS (202) 382-5043
FAX: (202) 475-8000

- **The Outreach and State Programs Section** which is responsible for working with State, Tribal and local governments and other Federal agencies; public information and education activities; international activities.

Contact: Glenn Eugster, Chief COMM: FTS (202) 382-5043
FAX: (202) 475-8000

- **The Wetlands Strategies and Initiatives Team** which is responsible for the development of and support for initiatives in such areas as comprehensive planning and water quality certification; Regional special or ecosystem initiatives.

Contact: Dianne Fish, Chief COMM: FTS (202) 382-5043
FAX: (202) 475-8000

- **Research and Science Liaison** which is responsible for the development of technical methods and information; liaison with the research community.

Contact: Doreen Robb COMM: FTS (202) 382-5043
FAX: (202) 475-8000

NOTE: Numbers are subject to change overtime. Call the EPA locator at FTS (202) 382-2090 for information on new numbers.

EPA Regional Offices

EPA Regional wetlands coordinators are responsible for a wide range of activities primarily associated with the permit program under Section 404 of the Clean Water Act.

The Section 404 program -- the principal Federal regulatory program governing activities in wetlands -- is administered jointly by the U.S. Army Corps of Engineers and the U.S. EPA. Other Federal agencies -- specifically, the U.S. Fish & Wildlife Service of the Department of Interior and the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration -- are given advisory and commenting roles in the 404 process. State and local agencies also play key roles. This program is statutorily authorized by Section 404 of the Federal Water Pollution Control Act of 1972, as amended (Clean Water Act). The Clean Water Act expressly prohibits the discharge of dredged or fill material into "waters of the United States" including most wetlands without prior approval from the Secretary of the Army.

EPA Regional coordinators' responsibilities include, but are not limited to the following general areas:

- Section 404 applications review,
- EPA 404(b)(1) guidelines (including advance identification of disposal sites),
- Section 404 enforcement activities,
- Delineation of Section 404 jurisdictional wetlands,
- State wetlands programs,
- State water quality certification,
- Information and outreach programs.

ENVIRONMENTAL PROTECTION AGENCY

REGION I

Thompson, Douglas, Chief
U.S. EPA - Region I
Wetlands Protection Section (WWP-1900)
John F. Kennedy Federal Building FTS: 835-4422
Boston, MA 02203-1911 COMM: (616) 565-4430

REGION II

Montella, Dan, Chief
U.S. EPA - Region II
Wetlands Section (2WM-MWP)
26 Federal Plaza, Room 837 FTS: 264-5170
New York, NY 10278 COMM: (212) 264-5170

REGION III

D'Angelo, Barbara, Chief
U.S. EPA - Region III
Wetlands and Marine Policy
Section (3ES42)
841 Chestnut Street FTS: 597-9301
Philadelphia, PA 19107 COMM: (215) 597-9301

REGION IV

Vanderhoogt, Gail Chief
U.S. EPA - Region IV
Wetlands Planning Unit (4WM-MWB)
345 Courtland Street, N.E. FTS: 257-2126
Atlanta, GA 30365 COMM: (404) 347-2126

REGION V

Ehorn, Doug, Deputy Chief
U.S. EPA - Region V
Water Management Division
Wetlands Protection Section
230 South Dearborn Street FTS: 886-0243
Chicago, IL 60604 COMM: (312) 353-2079

REGION VI

Thomas, Norman, Chief
U.S. EPA - Region VI
Technical Assistance Section (6E-FT)
1445 Ross Avenue FTS: 255-2263
Dallas, TX 75202 COMM: (214) 655-2260

REGION VII

Hershberger, Dianne, Chief
U.S. EPA - Region VII
Wetlands Protection Section (ENRV-404)
726 Minnesota Avenue FTS: 276-7573
Kansas City, KS 66101 COMM: (913) 551-7573

REGION VIII

Reetz, Gene
U.S. EPA - Region VIII
Water Quality Requirement
  Section (8WM-SP)
999 18th Street
500 Denver Place FTS: 564-1565
Denver, CO 80202-2405 COMM: (303) 293-1575

REGION IX

Oshida, Phil, Chief
U.S. EPA - Region IX
Wetlands Section (W-7-2)
1235 Mission Street FTS: 464-2187
San Francisco, CA 94103 COMM: (415) 744-2180

REGION X

Reilly, Bill, Chief
U.S. EPA - Region X
Water Resources Assessment
  Section (WD-138)
1200 Sixth Avenue FTS: 399-1412
Seattle, WA 98101 COMM: (206) 442-1412

REGION X - OREGON OPERATIONS OFFICE

Storm, Linda
U.S. EPA - Region X
Oregon Operations Office
522 Southwest 5th Avenue
Yeon Building, 2nd Floor
Portland, OR
FTS: 423-2716

REGION X - IDAHO OPERATIONS OFFICE

Olson, John
EPA - Region X
Idaho Operations Office
422 West Washington Street
Boise, ID 83702
FTS: 554-9488

REGION X - ALASKA OPERATIONS OFFICE

Robinson, Dan
EPA, Region X
Alaska Operations Office
701 C Street, Box 19
Anchorage, AK 99513
FTS: (907) 271-5083
COMM: (907) 271-5083

Wetlands Research

EPA's wetlands research program is divided into five topic areas:

- Wetlands mitigation (i.e., creation, restoration, enhancement)
- Cumulative impact assessment,
-
- Water quality functions of wetlands,
- Constructed wetlands, and
- The Environmental monitoring and Assessment Program.

The wetlands research program is under the direction of the Office of Research and Development in Headquarters, Washington, D.C.. However, the wetlands research program manager is in the Corvallis Laboratory, and the research is conducted primarily at the Corvallis and Duluth Labs. Contacts for wetlands research are:

EPA Headquarters

- Office of Environmental Processes and Effects Research

1. Stephen R. Cordle	202-382-5940
2. Chieh Wu	202-271-5940

- Office of Wetlands Protection

Bill Sipple	202-382-5066

Corvallis Lab

- Wetlands Program Matrix Manager

Eric Preston	FTS-420-4666

- Mitigation

Mary Kentula	FTS-420-4666

- Cumulative Impact Assessment

Scott Liebowitz	FTS-420-4666

- Constructed Wetlands

Richard Olson	FTS-420-4666

- Environmental Monitoring & Assessment Program (EMAP)

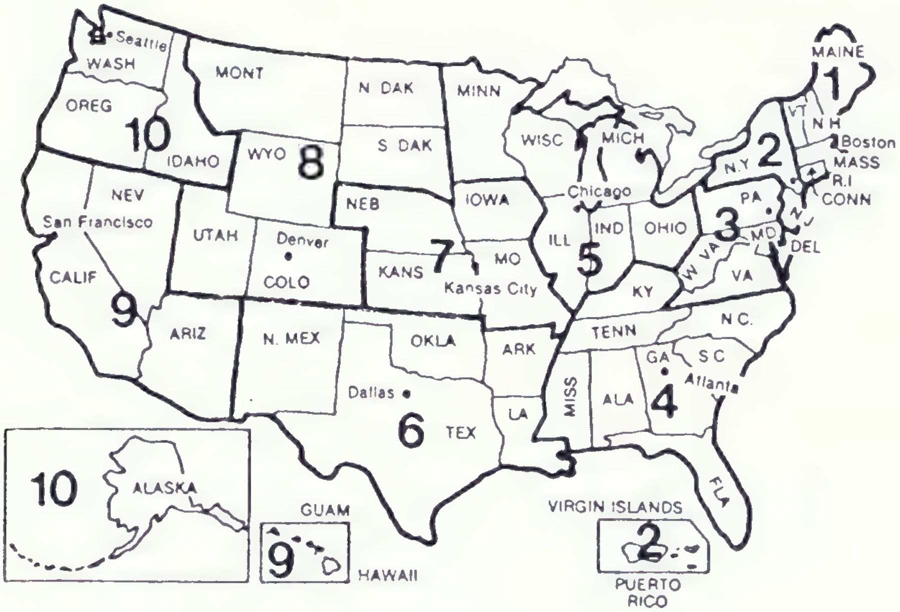
  Richard Novitski FTS-420-4666

Duluth Lab

- Water Quality

  William Sanville FTS-780-4723

EPA REGIONAL OFFICES


Seattle
WASH
OREG
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IDAHO
MONT
WYO
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N. DAK
S. DAK
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Chicago
NEV
San Francisco
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Kansas City
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IND
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OHIO
KY
ARIZ
N. MEX
OKLA
Dallas
6
TEX
ARK
LA
MISS
ALA
TENN
GA
Atlanta
4
S.C.
N.C.
FLA
W. VA
VA
MD
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N.J.
N.Y.
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Boston
MASS
R.I.
CONN
ALASKA
GUAM
HAWAII
VIRGIN ISLANDS
PUERTO RICO

Regions
4 — Alabama
10 — Alaska
9 — Arizona
6 — Arkansas
9 — California
8 — Colorado
1 — Connecticut
3 — Delaware
3 — D.C.
4 — Florida
4 — Georgia
9 — Hawaii
10 — Idaho
5 — Illinois
5 — Indiana
7 — Iowa
7 — Kansas
4 — Kentucky
6 — Louisiana

Regions
1 — Maine
3 — Maryland
1 — Massachusetts
5 — Michigan
5 — Minnesota
4 — Mississippi
7 — Missouri
8 — Montana
7 — Nebraska
9 — Nevada
1 — New Hampshire
2 — New Jersey
6 — New Mexico
2 — New York
4 — North Carolina
8 — North Dakota
5 — Ohio
6 — Oklahoma
10 — Oregon

Regions
3 — Pennsylvania
1 — Rhode Island
4 — South Carolina
8 — South Dakota
4 — Tennessee
6 — Texas
8 — Utah
1 — Vermont
3 — Virginia
10 — Washington
3 — West Virginia
5 — Wisconsin
8 — Wyoming
9 — American Samoa
9 — Guam
2 — Puerto Rico
2 — Virgin Islands

BUREAU OF RECLAMATION
WETLANDS PRESERVATION AND ENHANCEMENT INITIATIVE

Background

In October 1987, the Bureau of Reclamation announced a redirection of the agency's mission from one of water resource development to that of water resources management and stewardship. Accordingly, the agency is currently in transition from its traditional role of planning and constructing major water projects to focusing on rehabilitation and modernization of existing facilities and concentrating on total resource management including water conservation, groundwater recharge, and providing engineering expertise to other Federal programs.

Wetland Program Structure

In fiscal year 1991, the Bureau of Reclamation initiated a 5-year, multimillion dollar wetlands program which will emphasize three major elements; and inventory of wetlands and deep water habitats, construction of projects which support the goals and objectives of the North American Waterfowl Management Plan, and research and demonstration projects. Some specific activities currently underway include:

A. Wetlands Inventory. The Bureau of Reclamation has entered into a cost sharing arrangement with the U.S. Fish and Wildlife Service's National Wetlands Inventory to develop wetland maps for Bureau of Reclamation lands throughout the 17 Western States. Mapping efforts began in fiscal year 1990 and should be completed in fiscal year 1993.

B. Activity Integration and Coordination. The Bureau of Reclamation is integrating its wetland activities across all traditional agency programs (planning, operations and maintenance, construction, loans) and activities as well as pursuing cooperative efforts with other Federal and state agencies, water users, and special interest groups.

C. Research and Development. The agency's wetland research and development activities are currently focused at the local, individual wetland level. Studies have been initiated to assess wetland functioning and cause-and-effect mechanisms. Demonstration projects are being initiated in southern California and Arizona to determine how best to integrate constructed wetlands with conventional wastewater treatment facilities to achieve total integrated water resource management in arid climates.

D. Technical Capabilities. The Bureau of Reclamation has initiated efforts to develop an in-house technical capability in wetlands ecology, management, and engineering. A special 5-day workshop will be held for Bureau of Reclamation employees in jurisdictional delineation and classification of wetlands during June 1991. In addition, a set of technical guidelines for wetlands design and construction is being developed.

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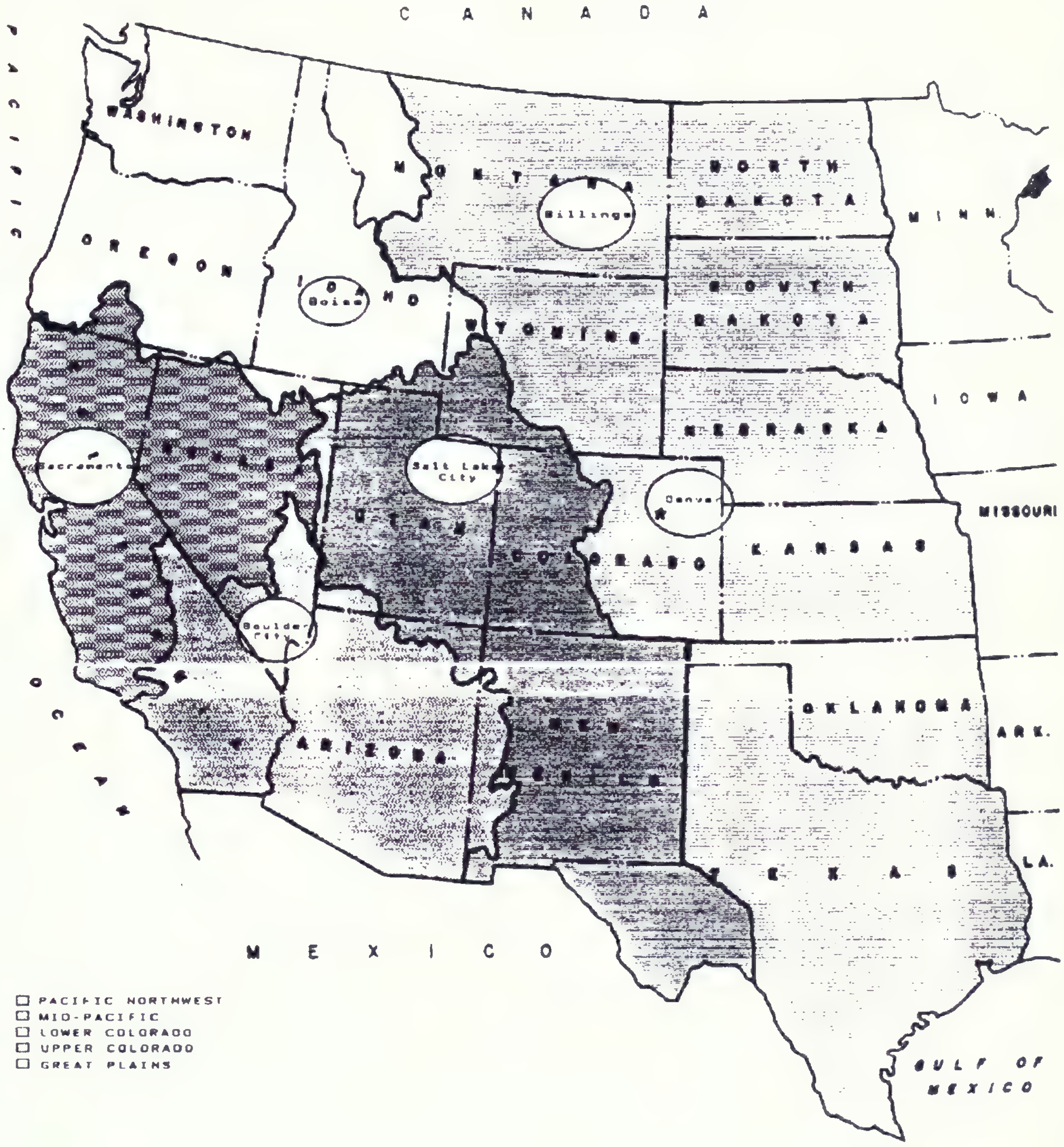
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BUREAU OF RECLAMATION

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U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

The Soil Conservation Service (SCS) does not manage public lands, however, they provide technical assistance to private landowners and federal, state, and local units of government.

SCS provides technical assistance (e.g., soils, biology, engineering) to landowners to achieve conservation objectives. This assistance includes the restoration, creation, and enhancement of wetlands.

SCS is responsible for delineating wetlands for implementation of the 1985 Farm Bill ("Swampbuster") and the 1990 Food, Agriculture, Conservation, and Trade Act (FACTA). In addition, the 1990 FACTA included the Wetland Reserve Program which provides financial and technical assistance to restore and protect 1,000,000 acres of wetlands over the next five years.

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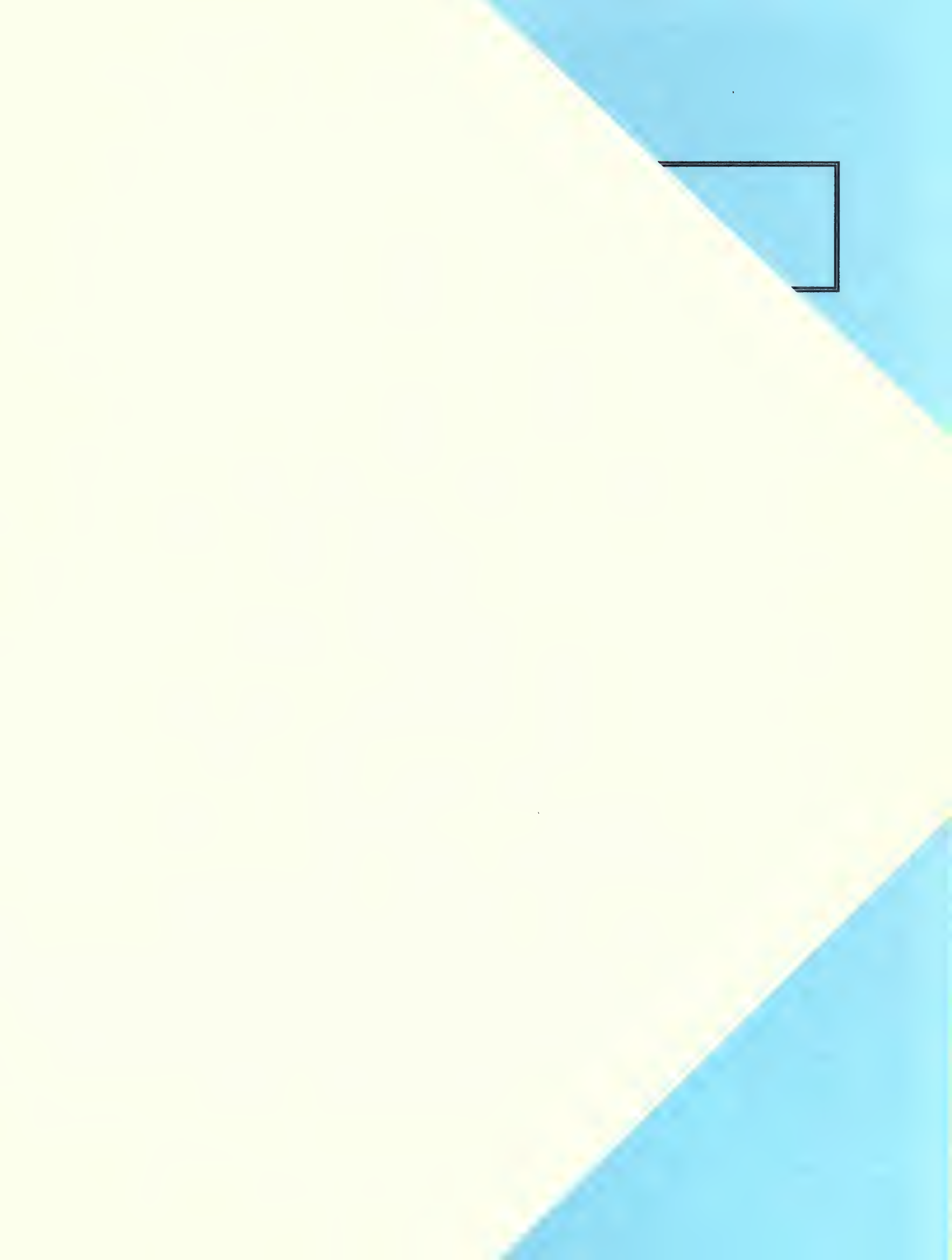

Attachment N

STATE ACTS, POLICIES AND EXECUTIVE ORDERS PERTAINING TO WETLANDS

ATTACHMENT N-1

Development and Use of a Wetland Bank as a Mitigation Alternative in Idaho

DEVELOPMENT AND USE OF A WETLAND BANK AS A MITIGATION ALTERNATIVE IN IDAHO.

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ABSTRACT

Federal policy requires the Idaho Transportation Department (ITD) to avoid impacts to wetlands by alternative roadway locations or benign construction techniques. Impacts to wetlands for which there is no "practicable alternative" require mitigation in the form of restoration or compensation.

Wetland restoration is, at times, impossible to accomplish on-site, comes with such risk that successful mitigation cannot be assured, or can be accomplished only at extraordinary cost. Use of a previously constructed, off-site wetland may be appropriate in these situations to compensate for wetland losses.

This paper documents development of the wetland banking concept in the State of Idaho and the consensus building which has led to a memorandum of agreement with all resource and regulatory agencies with a statutory interest in wetland issues. Wetland banking has been used in other states to mitigate for the impacts of a single project or to compensate for minor wetland losses. However, the Idaho effort is the first to enlarge the scope of wetland banking to an entire state and to all the activities of a single agency.

This paper describes the issues associated with wetland banking and their resolution by an inter-agency team; the mechanics of the wetland bank and the activities for which it may be used; and the philosophy and components of conceptual site plans for wetland banks. The preliminary results of a wetland revegetation experiment are presented.

INTRODUCTION

Rarely do resource, regulatory, and development agencies adjourn from a a series of meetings with everyone agreeing that their interests have been best served. However, the unlikely appears to have happened with the recent development of an agreement authored by the Idaho inter-agency wetland banking team.

Over the past three years the Idaho inter-agency wetland banking team has investigated the usefulness of banking as a mitigation alternative for roadway impacts to wetlands in Idaho. Team members include representatives from the United States Fish and Wildlife Service, Environmental Protection Agency, Army Corps of Engineers, Federal Highway Administration, and Idaho Departments of Fish and Game, Water Resources, Health and Welfare, Lands, and Transportation.

This paper offers a toolbox of ideas, based on our experience, for you to develop or evaluate wetland banks in your own region. I will describe the issues associated with wetland banking and their resolution by the inter-agency team; the mechanics of the wetland bank and the activities for which a bank may be used; and the philosophy and components of conceptual site plans for wetland banks. And finally, I will present the preliminary results of a wetland revegetation experiment designed to improve our ability to replicate natural systems.

In our first meeting - held November 19, 1985 - we identified both common ground and differences which had to be resolved to develop an agreement.

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* IN: Proceedings of the Rocky Mountain Chapter of the Society of Wetland Scientists: Restoration, Creation, and Management of Wetland and Riparian Ecosystems of the American West.

Concerns expressed by the team and answered by our discussions include:

- Skepticism that wetland restoration techniques can fully restore all wetland functions and values. The team recognized early that the state-of-the-art of wetland creation is more art than science. Projects in-place and on-the-ground can be better evaluated than the promise offered by plans for mitigation.

- Concern that a wetland bank will be perceived as "buying" a §404 permit. The team agreed the purchase of existing wetlands or the establishment of a fund for other agencies to create wetlands was not acceptable.

- Skepticism of wetland banking at higher levels in the bureaucracy. A "ghost" policy at the headquarters office of a federal resource agency briefly prevented the agency from signing an agreement. This policy discourages the development and use of wetland banks. Local agency personnel call this a "ghost" policy because although it appears real, there is no document which describes it.

- Disagreement on who is responsible for financing operation and maintenance of wetland banks. Federal Highway Administration policy prohibits state transportation agencies from using federal dollars for operation and maintenance of roadway projects, including wetland banks. State monies are sparse. A trade of Habitat Evaluation Procedure (HEP) credits rather than dollar currency is a possible solution to this problem.

- Concern that there is a need for change in agency policy to make wetland banking work. Specifically, a change in the mitigation policies of the US Fish and Wildlife Service and the Environmental Protection Agency that describe in-kind, on-site mitigation as most desirable.

- And finally, different concepts among agency personnel of what is wetland banking?

WHAT IS WETLAND BANKING?

The team envisions wetland banking as the offsite creation, restoration, or enhancement of wetlands to compensate for unavoidable impacts of constructing, operating, and maintaining roads by the Idaho Transportation Department (ITD). The practice enters the gray zone of US Environmental Protection Agency and US Fish and Wildlife Service mitigation policies in that wetland bank sites may be distant from an impacted wetland.

Wetland banking has been used infrequently in few states to mitigate for the impacts of a single project or to compensate for minor wetland losses. However, the Idaho effort is the first to enlarge the scope of wetland banking to an entire state and to all the activities of a single agency.

WHY CHANGE PRESENT PRACTICE?

E.O. 11990 - Protection of Wetlands delivered a message to the Idaho Transportation Department and other development agencies that wetlands are of national importance. Idaho Transportation Department activities in wetlands are scrutinized by federal and state resource and regulatory agencies, and the Federal Highway Administration.

Resistance to promulgated rules and regulations resulting from E.O. 11990 caused conflicts with regulatory and resource agencies, and delay in project approvals. Time is money in the highway business. It is the need for greater efficiency, and not empathy for the resource, that likely encouraged the Department to change their way of doing business.

Historically, mitigation has not been required by the regulatory agencies for wetlands impacted by some roadway projects. This, and the frustration of negotiating a reasonable mitigation plan but seeing it poorly implemented likely motivated resource agencies to sit at the negotiating table and change present practice.

Present federal policy requires the Idaho Transportation Department to avoid impacts to wetlands by alternative roadway locations or benign construction techniques. Impacts to wetlands for which there is no "practicable alternative" may require mitigation in the form of restoration or compensation.

However, history has shown that wetland restoration is, at times, impossible to accomplish where the impact occurs, comes with such ecological risks that successful mitigation cannot be assured, or can be accomplished only at extraordinary cost. Use of a previously constructed, off-site wetland may be appropriate in these situations to compensate for wetland losses.

The team concluded that appropriate use of a wetland bank can benefit both the Idaho Transportation Department, and regulatory and resource agencies. It will allow for successful mitigation of several projects with minor individual, but significant cumulative impacts. It will allow for better evaluation of a mitigation proposal by presenting a functioning wetland, rather than a paper plan. It will improve agency coordination by positioning agencies in a planning rather than a reactive mode. And, it will expedite project permit review.

Examples of Idaho Transportation Department activities which may be mitigated by the wetland bank are the placement of sliver fills for roadway widening or curve straightening, placement of fills for bridge abutments and piers, placement of rip-rap on the face of existing roadway fills to prevent erosion, and emergency maintenance of existing roadways threatened by flood or other natural disaster.

THE WETLAND BANK DOES NOT GIVE THE DEVELOPMENT AGENCY CARTE BLANCHE

The team agrees that use of the wetland bank comes with conditions. For example, a wetland bank should be capable of compensating for all the wetland functions and values lost as a result of a project.

While the wetland bank will be considered one of the practicable mitigation alternatives for Idaho Transportation activities, it may be used only after all other restoration and compensation methods have been examined and found to be impracticable.

Finally, it is recognized that the wetland bank may not be appropriate mitigation for wetlands considered unique because of their physical, chemical, or biological composition or ecological importance. And, it may not be practical to establish a wetland bank for some wetland classes, such as bogs and forested wetlands.

THE NUTS AND BOLTS OF WETLAND BANKING

The terms of the agreement state that Idaho Transportation may use its best judgement to locate and develop individual wetland bank sites at depleted borrow sources, uneconomical remainders of right-of-way, or other publicly owned properties. As a general rule, Idaho Transportation will locate individual wetland bank sites at locations that have the physical, chemical, and biological character to support wetland development. Guidelines for location of a wetland bank include, but are not limited to: the bank site should be as close to the anticipated impact site as possible, the bank site should be within the same hydrologic basin as the impact site, and the same public affected by an impact should be compensated by the bank.

Prior to this agreement, borrow sources were reclaimed as prescribed by state law. This resulted in steeply sloped pits, revegetated with grasses intended only to control erosion. With the finalized agreement, Idaho Transportation will be encouraged to reclaim borrow sources in a manner that results in fully functioning wetlands. This includes grading to encourage structure and diversity, the use of native trees, shrubs, and grasses that are best adapted to the site, and the placement of structures to provide fish and wildlife habitat.

Idaho Transportation will design and construct the wetland bank. Regulatory and resource agencies will be encouraged to express their interests and to provide their expertise. Each of the wetland bank sites will be designed to be easily managed and to function with little or no human intervention.

Two strategies will guide development of wetland bank sites. The first prescribes the creation, restoration, or enhancement of a wetland of a particular system and class (eg. palustrine, emergent wetland), with no emphasis given to any one function or value. The second prescribes the development of a wetland with emphasis given to functions and values of special concern (eg. habitat for waterfowl). Other wetland values may be incidentally provided by this strategy. However, they are not a part of the intentional plan to compensate for losses.

Idaho Transportation acknowledges that regulatory and resource agencies provide no guarantee that an individual wetland bank site will be accepted as mitigation. Their approval will be sought during the US Army Corps of Engineers §404 - Dredge and Fill permit review process and at the time of a proposed trade. This minimizes risk to the regulatory and resource agencies, and motivates Idaho Transportation to maximize the quality of proposed wetland bank sites. Review and approval will require Idaho Transportation to demonstrate a functioning wetland has been created according to a previously prepared plan.

A transaction from the wetland bank will not be complete until a public agency, preferably a resource agency, accepts ownership of the property and responsibility for operation and maintenance. No public agency is obliged to accept these responsibilities.

THE FUTURE

With the finalized agreement, the initial wetland banking effort will focus on pilot projects in borrow sources. In addition, Idaho Transportation may inventory existing wetlands for enhancements. The experience gained by the pilot projects will be used to review and modify the memoranda of agreement prior to expansion of the wetland banking program.

At present, we are actively developing our first proposed wetland bank site. The site is located at the Mud Lake Wildlife Management Area in eastern Idaho. We are also in the very early stages of investigating the appropriateness of a second wetland bank site on the Snake River.

There is cautious confidence that the efforts of the team will add to the diminishing acreage of wetlands in the Intermountain West and improve our knowledge of methods and techniques to intentionally create wetlands.

KNOWLEDGE OF METHODS AND TECHNIQUES TO INTENTIONALLY CREATE WETLANDS

Idaho, like many areas of the country, suffers from a lack of study of wetland systems. Efforts to intentionally create wetlands can greatly benefit from advances in the state-of-the-art of wetland science. In recognition of this, the US Environmental Protection Agency, Federal Highway Administration, and the Idaho Transportation Department are presently supporting research designed to improve our ability to replicate natural systems. Preliminary results of a wetland revegetation experiment offer interesting information and suggests means to best manage wetlands.

Results of this research, conducted in palustrine, emergent wetlands within the riparian zone of the Boise River, suggest the following:

- A ground slope of 5:1, from open water to 0.4 meters elevation above the ordinary high water line, supports a reasonable diversity of hydrophytic plant species. Desirable species include: broad-leaved cattail (*Typha latifolia*), spike rush (*Eleocharis palustris*), soft rush (*Juncus effusus*), slender rush (*Juncus tenuis*), jointed rush (*Juncus articulatus*), and longstyle rush (*Juncus longistylis*).

- A ground slope of 5:1, from 0.4 meters above the ordinary high water line to uplands, supports weedy plant species that are undesirable members of the wetland plant community.

The results have strong implications for the design and management of wetlands. Specifically, the area below the ordinary saturated soil zone but above ordinary open water may be final graded to ≥ 5:1 slopes. The area above the ordinary saturated soil zone should rise at its angle of repose.

These specifications will likely minimize what I call the Goldielocks phenomenon, that is a site is just wet enough to support both desirable hydrophytes and facultative weedy plant species, but not wet enough to exclude the weedy species.

The analogy to Goldielocks goes something like this. Goldielocks - a weed to the Bear family - found Papa Bear's porridge too hot and Baby Bear's porridge too cold, so she spilt. But Mama Bear's porridge was just right so she hung around to the dismay of the Bear family.

Finally, my research suggests that the diversity of wetland vegetation cover types increases with the presence of discontinuities on site. They include the intrusion on the wetland of high flow channels of an adjacent river, the presence of downed timber, and localized areas of erosion. Selective placement of downed timber within and adjacent to a wetland may be of considerable benefit to wetland creation projects.

In summary, wetland banking may be appropriate when traditional mitigation measures are impracticable or infeasible, in-kind mitigation is impossible to accomplish on-site, the risk of a paper plan for mitigation comes with such ecological risk that success cannot be assured, the significant cumulative impacts of individually minor wetland losses require mitigation, or project approval must be expedited.

Wetland banking is not appropriate when traditional mitigation measures are available. They are, in order of desirability, developing alternative roadway locations that avoid wetland impacts, use of thoughtful roadway designs that minimizing damage to wetlands, restoring impacted wetlands to their original condition, or compensating with the development of replacement wetlands in-kind and on-site.

A number of factors contributed to the successful completion of an agreement and the productivity of the team. Perhaps the most important include:

- Inviting and actively encouraging participation by all of the players with a statutory interest in wetlands.

- Basing team decisions on a consensus of opinion that assured all persons would be heard and all concerns would be addressed, rather than a mere majority.

- Open negotiation that recognized that there was more than one right solution to a concern.

- A bail out clause that allows any participant in the agreement to withdraw with notice.

- Acceptance that the existing agreement is a working document that will be refined as we gather greater experience.

- Recognition of the missions of each agency and for their policies, rules, and regulations.

- And, realization that none of us are as smart as all of us.

REFERENCES

Council on Environmental Quality. Council on Environmental Quality Terminology and Index. 40 CFR §1508.20

Executive Order 11990 - Protection of Wetlands. Federal Register, Vol. 42, No. 101. 5 pp.

Tiedemann, R.B. 1988. Memorandum of Agreement for Development and Use of a Wetland Bank in Idaho. Idaho Transportation Department, Boise, ID. 6 pp.

Tiedemann, R.B. 1988. Operating Procedures for Development and Use of a Wetland Bank in Idaho. Idaho Transportation Department, Boise, ID. 8 pp.

Tiedemann, R.B. 1988. Unpublished data.

US Department of the Interior, US Fish and Wildlife Service. 1981. US Fish and Wildlife Service Mitigation Policy. Federal Register, Vol. 46, No. 15. 20 pp.

US Department of Transportation. 1978. Preservation of the Nation's Wetlands. DOT Order 5660.1A. 7 pp.

US Department of Transportation. 1980. Mitigation of Environmental Impacts to Privately Owned Wetlands. 23 CFR 777. 5 pp.

US Environmental Protection Agency - Region X. 1985. §404 Mitigation Policy. 7 pp.

Memorandum of Agreement for Development and Use of a Wetland Bank in Idaho

1. Preamble:

a. The Idaho Transportation Department (ITD) operates within the direction given by Executive Order 11990, "Protection of Wetlands". Federal aid projects must comply with Department of Transportation (DOT) Order 5660.1A, "Preservation of the Nation's Wetlands" which results from this executive order. DOT Order 5660.1A requires that ITD demonstrate there is no practicable alternative to construction in a wetland and all practicable measures to minimize harm have been included in the project.

b. Impacts to wetlands for which there is no practicable alternative may require mitigation. In accordance with Council on Environmental Quality regulations (40 CFR §1508.20), mitigation includes:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

c. Avoiding, minimizing, rectifying, or reducing wetland impacts is, at times, impossible to accomplish onsite, comes with such risk that successful mitigation cannot be assured, or can be accomplished only at extraordinary cost. Use of a previously constructed, off-site wetland may be appropriate in these situations to compensate for wetland losses. Such use is consistent with the definition of mitigation provided by 40 CFR §1508.20(e).

2. Authority:

a. This memorandum of agreement is established in accordance with the following authorities:

- Clean Water Act (33 USC 1251 et seq.)
- National Environmental Policy Act (42 USC 4321et seq.)
- Executive Order 11990
- Preservation of the Nation's Wetlands (DOT Order 5660.1A)
- Mitigation of Environmental Impacts to Privately Owned Wetlands (23 CFR 777)
- Stream Channel Protection Act (Idaho Code §42-3803 et seq.)
- Lake Protection Act (Idaho Code §58-104(9) and §58-142 et seq.)

3. The Wetland Banking Concept:
a. Wetland banking, for the purposes of this memorandum of agreement, is defined as the following: The offsite creation, restoration, or enhancement of wetlands, which are waters of the United States, to compensate for unavoidable impacts due to roadway development, operation, and maintenance activities by the Idaho Transportation Department. The bank represents a net gain of wetlands to be drawn upon to offset losses caused by activities which otherwise comply with the requirements of the Clean Water Act.

4. Consistency with Established Legislation, and Rules and Regulations:
a. The wetland banking program will operate within the constraints of the National Environmental Policy Act, the Clean Water Act, Executive Order 11990, and all other federal and state legislation, and rules and regulations.

b. The term wetland is defined by US ACE rules and regulations [33 CFR §328.3(b)].

5. Areas and Activities for which Wetland Banking may be Considered:
a. The wetland bank will be considered one of the practicable mitigation alternatives for ITD construction, operation, and maintenance activities. It may be used only after all other mitigation methods [ie. 40 CFR §1508.20(a) through (d)] have been examined and found to be impracticable.

b. The wetland bank will not normally be used to mitigate for the loss of wetlands which are considered unique because of their physical, chemical, or biological composition or ecological importance. These wetlands will be identified during the early coordination phase of the environmental review process and plans will normally be made for mitigation other than wetland banking.

6. Criteria for Location and Development of a Wetland Bank:
a. ITD may use its best judgement and consultation with interested agencies to locate and develop individual wetland bank sites at depleted borrow sources, uneconomical remainders of right-of-way, and other publicly owned properties. As a general rule, ITD will locate individual wetland bank sites at locations that have the physical, chemical, and biological character to support wetland development, and as close to anticipated impact sites as possible.

b. FHWA will participate in the cost of development of a wetland bank when a loss to a wetland resource, attributable to a federal aid construction activity, has been documented. FHWA will approve federal aid participation for that portion of the wetland bank required to mitigate for specific impacts attributable to a single federal aid project.

c. ITD acknowledges that regulatory and resource agencies provide no guarantee that an individual wetland bank site will be accepted as mitigation at the time of a proposed trade, or that permits for a particular project will be issued even though mitigation is offered.

d. The wetland bank shall be publicly owned and maintained.

7. Criteria for Use of a Wetland Bank:

a. Conceptual review and concurrence in the proposed use of the wetland bank will be sought from regulatory and resource agencies as part of the early coordination phase of the environmental review process. Normally, this will occur after project alternatives and their impacts have been identified. Conceptual review and concurrence will require ITD to demonstrate a wetland bank site is likely to function according to a previously prepared plan.

b. Final concurrence from regulatory and resource agencies for use of the wetland bank will normally be sought during the §404 permit review process. Significant new information not available at the time of conceptual review and concurrence will be provided at this time.

c. ITD will retain ownership or interest in the wetland bank, and responsibility for operation and maintenance until an agreement with another public agency is completed. ITD will normally solicit a public resource agency to accept ownership and responsibility for an individual wetland bank site at the time all of the resource credits from the site have been withdrawn. No public agency is obliged to accept ownership or responsibility.

d. Lands withdrawn from the bank shall normally be functionally equal to those damaged or destroyed. Replacement for impacted wetlands shall normally be on a one to one basis, by area. Situations exist when it is more practical to construct a greater acreage of lesser quality wetland rather than the same acreage of equal quality wetland. In such case, a loss of quality may be compensated for by an increase in quantity. However, in no case may the dollar value of out-of-kind replacement exceed the cost of in-kind replacement.

e. Wetlands intentionally or incidentally created by ITD prior to execution of this agreement shall not be credited to the wetland bank. Wetlands created or enhanced by ITD after execution of this agreement shall be credited to the wetland bank.

f. The wildlife values offered by early successional stages of a wetland bank site will be credited to ITD at the time of a proposed trade according to the amortization process outlined by HEP.

g. The wetland bank may be used to mitigate for cumulative impacts to wetlands resulting from several roadway activities.

8. Evaluation Methods:

a. The FHWA *Method for Wetland Functional Assessment* (Adamus method) may be used to evaluate wetland functions and values. The US FWS *Habitat Evaluation Procedures* (HEP) may be used to evaluate wildlife values when they are of prime concern. Both methods may be used in combination to provide the greatest level of detail. Wetland evaluations shall be done by a team, with representatives from interested agencies.

b. Neither Adamus nor HEP may be required in simple situations where best professional judgement will do. Full documentation will be required, regardless of the method of assessment .

c. The appropriate assessement method(s) will be agreed to by representatives from each of the interested agencies.

9. Record Keeping:

a. ITD will establish and maintain records which document the activity of the wetland bank accounts. Signatories to this memorandum of agreement and other interested agencies will be sent periodic statements documenting the status of the account. Statements will be generated after each transaction and at the end of each construction season.

10. Pilot Project:

a. The initial wetland banking effort will be limited to pilot projects in borrow sources. In addition, ITD may inventory existing wetlands for potential enhancements. The experience gained by the pilot projects will be used to review and modify this agreement prior to further development of the wetland bank.

11. Modification and Termination of the Memorandum of Agreement:

a. This agreement and the attached operating procedures may be modified with the approval of all signatories to the memorandum of agreement. Modifications may be proposed by a single or inter-agency team of signatories. Proposed modifications will be submitted for a sixty day period of review to all signatories and approval of the proposed modification will be indicated by written acceptance.

b. This agreement and the attached operating procedures should be viewed as working documents which will be reviewed by all signatories to the agreement and interested agencies within two years of establishing the first wetland bank site.

c. A signatory may terminate their participation in this agreement upon written notice to all other signatories.

E. Dean Tisdale — 7-28-87
Idaho Transportation Department — Date

Jack T. Coe — 7/28/87
Federal Highway Administration — Date

James B. Royce — 16/12/87
US Army Corps of Engineers — Date

11-10-87
US Environmental Protection Agency — Date

9/22/88
US Fish and Wildlife Service — Date

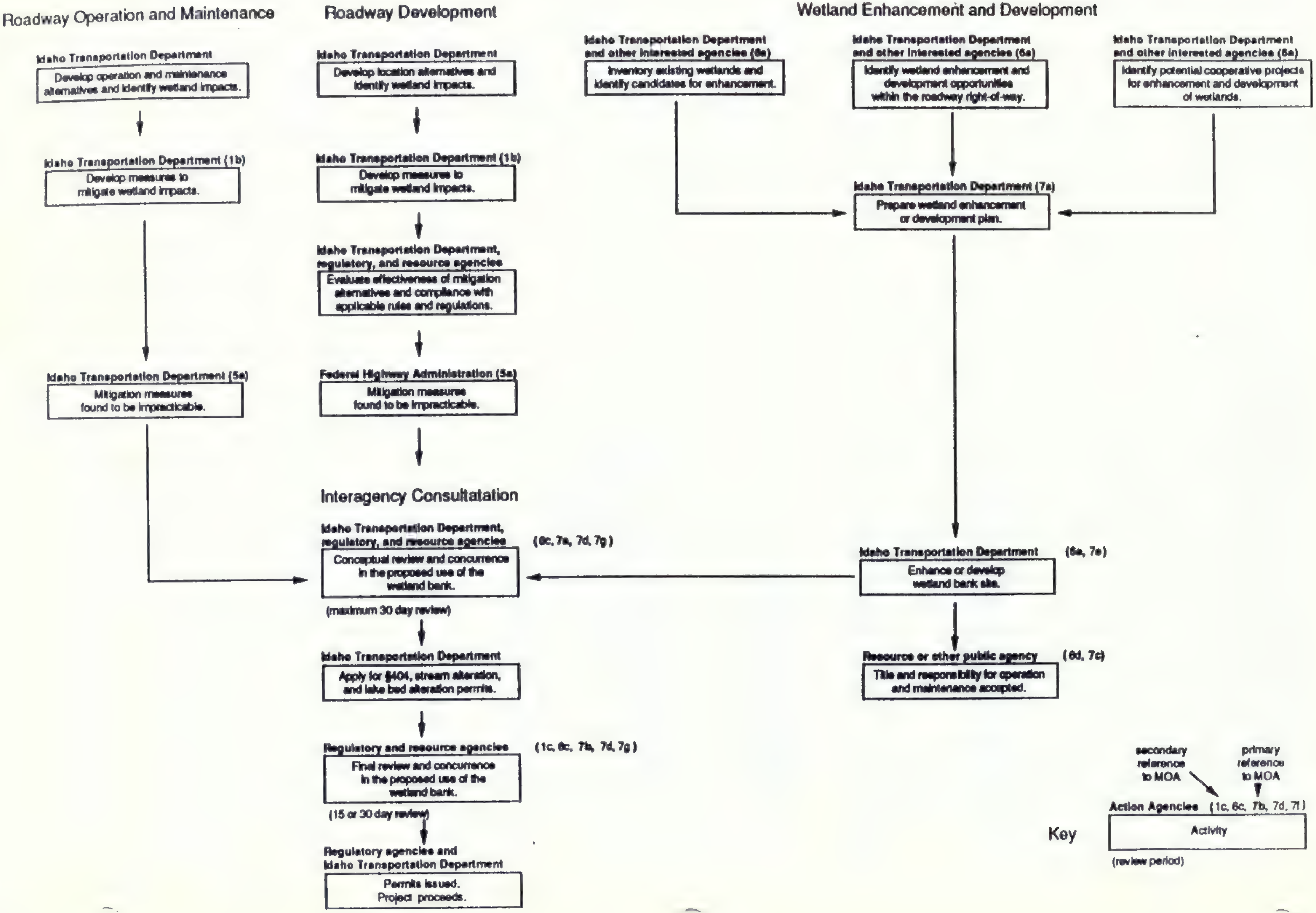
8-24-87
Idaho Department of Fish and Game — Date

R. Keith Higginson — 10/07/87
Idaho Department of Water Resources — Date

Stanley F. Hamilton — 9-2-87
Idaho Department of Lands — Date

Charles W. Moss Deputy Director — 8/13/87
Idaho Department of Health and Welfare — Date

Figure 1 - Outline of the Wetland Banking Process


Roadway Operation and Maintenance
Idaho Transportation Department
Develop operation and maintenance alternatives and identify wetland impacts.
Idaho Transportation Department (1b)
Develop measures to mitigate wetland impacts.
Idaho Transportation Department (5a)
Mitigation measures found to be impracticable.
Roadway Development
Idaho Transportation Department
Develop location alternatives and identify wetland impacts.
Idaho Transportation Department (1b)
Develop measures to mitigate wetland impacts.
Idaho Transportation Department, regulatory, and resource agencies
Evaluate effectiveness of mitigation alternatives and compliance with applicable rules and regulations.
Federal Highway Administration (5a)
Mitigation measures found to be impracticable.
Wetland Enhancement and Development
Idaho Transportation Department and other interested agencies (6a)
Inventory existing wetlands and identify candidates for enhancement.
Idaho Transportation Department and other interested agencies (6a)
Identify wetland enhancement and development opportunities within the roadway right-of-way.
Idaho Transportation Department and other interested agencies (6a)
Identify potential cooperative projects for enhancement and development of wetlands.
Idaho Transportation Department (7a)
Prepare wetland enhancement or development plan.
Interagency Consultatation
Idaho Transportation Department, regulatory, and resource agencies
(6c, 7a, 7d, 7g)
Conceptual review and concurrence in the proposed use of the wetland bank.
(maximum 30 day review)
Idaho Transportation Department
Apply for §404, stream alteration, and lake bed alteration permits.
Regulatory and resource agencies
(1c, 6c, 7b, 7d, 7g)
Final review and concurrence in the proposed use of the wetland bank.
(15 or 30 day review)
Regulatory agencies and Idaho Transportation Department
Permits issued. Project proceeds.
Idaho Transportation Department
(6a, 7e)
Enhance or develop wetland bank site.
Resource or other public agency
(6d, 7c)
Title and responsibility for operation and maintenance accepted.
Key
secondary reference to MOA
primary reference to MOA
Action Agencies
(1c, 6c, 7b, 7d, 7f)
Activity
(review period)

Operating Procedures for Development and Use of a Wetland Bank in Idaho

The following are operating procedures which result from the memorandum of agreement for developoment and use of a wetland bank in Idaho and are intended to further define and implement the memorandum. Procedures for additions and modifications to these operating procedures are outlined in the memorandum of agreement.

1. Preamble:

a. The Idaho inter-agency wetland banking team has investigated the usefulness of banking as a mitigation technique for roadway impacts to wetlands. Team members include representatives from the following agencies:

United States Fish and Wildlife Service (US FWS)
United States Environmental Protection Agency (US EPA)
United States Army Corps of Engineers (US ACE)
Federal Highway Administration (FHWA)
Idaho Department of Lands (IDL)
Idaho Department of Fish and Game (IDFG)
Idaho Department of Water Resources (IDWR)
Idaho Department of Health and Welfare, Division of Environment (IDHW, DE)
Idaho Transportation Department (ITD)

b. The team concluded that appropriate use of a wetland bank could benefit both development and resource agencies. It will:

- Allow for mitigation of unavoidable impacts to wetlands.
- Create the opportunity to develop a comprehensive mitigation plan - rather than piecemeal mitigation - for several projects with minor individual, but significant cumulative impacts to wetlands.
- Allow for better evaluation of a mitigation proposal by presenting a functioning wetland, rather than a paper plan.
- Create the opportunity to develop one large, more easily managed, wetland mitigation site rather than numerous, small sites.
- Improve agency coordination by positioning agencies in a planning rather than a reactive mode.
- Expedite project permit review.

2. The Wetland Banking Concept:

a. Examples that illustrate the definition of wetland banking provided by the memorandum of agreement include, but are not limited to:

- Reclamation of a borrow source, prior to construction of a roadway project, in a manner which provides the wetland values lost as a result of the project.
- Wetland development in uneconomical remainders of roadway right-of-way. The developed wetland may serve the function of improving the quality of roadway runoff prior to discharge to a receiving water.
- Restoration of wetlands, within the right-of-way of a roadway project, in excess of that required to mitigate for a loss attributable to the project. Mitigation beyond that required is credited to a wetland bank for use by future projects, distant from the restored wetland.
- Purchase of private property adjacent to existing public lands and development of the purchased property as a wetland. Title and maintenance of the land is assumed by an adjacent public agency other than ITD (ie. US FWS, US Bureau of Land Management, US Forest Service, IDL, IDFG).
- Fencing an off-site wetland, immediately threatened by grazing or other activity, and supplementing existing wetland vegetation with intentional plantings to improve wetland values.

3. Areas and Activities for which Wetland Banking may be Considered:

a. Examples of ITD activities that may impact existing wetlands and may potentially be mitigated by the wetland bank include, but are not limited to:

- Reconstruction of roadways on improved alignments.
- Placement of sliver fills for roadway widening or curve straightening.
- Placement of fills for bridge abutments and piers.
- Placement of rip-rap on the face of roadway fills to prevent losses due to erosion.

4. Location and Development of a Wetland Bank:

a. The need for a wetland bank should be identified, and the location of potential wetland bank sites should be reviewed in cooperation with interested agencies.

b. The wetland bank must either be a newly developed wetland, or the enhancement of an existing wetland. The preservation of an existing wetland is not consistent with the concept of wetland banking, with one exception. That exception being the purchase of privately owned wetlands, which are threatened with immediate destruction or alteration and not regulated by federal, state, or local regulation.

c. The wetland bank should be capable of compensating for the wetland functions and values (ie. ground water recharge and discharge, flood storage and desynchronization, shoreline anchoring and dissipation of erosive forces, sediment trapping, nutrient retention and removal, food chain support, habitat for fish and wildlife, active and passive recreation and heritage value) lost as a result of a project .

d. Strategies to guide development of a wetland bank include:
- Developing a wetland of a particular type (eg. palustrine persistent emergent wetland), with no emphasis given to any one function or value.
- Developing a wetland with emphasis given to functions or values of greatest concern (eg. bald eagle habitat, ground water recharge). Other wetland values may be incidently provided by this strategy but are not an intentional part of the prescription to compensate for losses.

These and other strategies should be tailored to the anticipated impacts of a proposed roadway project.

e. Credits may remain in an established wetland bank after its partial use by a project. In such cases, ITD may request regulatory and resource agencies to identify the geographic boundaries that surround other roadway projects for which the wetland bank may be acceptable mitigation. This will allow ITD to anticipate possible use of the wetland bank by future projects.

f. In accordance with FHWA policy, in-kind wetland replacement outside of roadway right-of-way is acceptable only when in-kind replacement within the right-of-way (ie. within the roadway median, borrow pit areas, interchange areas, and along the roadside) is impossible or extraordinarily expensive.

g. Guidelines for location of a wetland bank include, but are not limited to:
- The bank site should be as close to the impact site as possible.
- The bank site should be within the same hydrologic basin as the impact site.
- The same public affected by an impact site should be compensated by the bank site.
- The bank site should be within the same ITD district as the impact site.

h. ITD will insulate wetland bank sites from outside influences and impacts (eg. alteration of drainage or topography by adjacent land owners, disturbances to wildlife by visitors, vandalism). Recognized methods include careful location of the site to minimize impacts, developing large-in-size wetlands, and coordinating with other agencies and local governments to ensure appropriate land use policies are in place.

i. Cooperative projects with IDFG, US FWS, and land management agencies such as the US Forest Service and the US Bureau of Land Management are encouraged. The principal advantage of cooperative projects is the ease of managing contiguous areas as compared to isolated bank sites.

j. ITD will design and construct wetland banks. Regulatory and resource agencies will be encouraged to express their interests and to provide expertise as requested by ITD.

k. A wetland bank site will be designed to be easily managed and to function with little or no human intervention. Suggested methods to achieve these goals include developing one large - rather than numerous small, wetland bank sites - and locating the site adjacent to an existing management area. IDFG will normally be the first agency offered ownership in a wetland bank site and responsibility for operation and maintenance.

l. The costs associated with the development of a wetland bank that are determined by FHWA to be practicable mitigation measures for federal aid projects, are eligible project costs and reimbursable to ITD. FHWA financial participation in the development of a wetland bank is dependent on the continued maintenance of the site by a public agency. FHWA will not pay for maintenance of a wetland bank.

m. ITD will normally bid contracts for revegetation of a wetland bank site with the provision that plant materials will be replaced by the contractor if they perish within one growing season.

n. Instruction will be provided by ITD to the public agency assuming ownership of a wetland bank site to assist them in managing wetlands for values other than those within their area of expertise.

o. Use of the wetland bank to mitigate for project related wetland impacts will require ITD to demonstrate the following:

1) The activity causing a wetland impact is unavoidable.
2) All other restoration and compensation methods have been examined and found to be impracticable.
3) A functioning wetland has been created according to a previously prepared plan, and its usefulness documented by an evaluation program.

p. Strategies to mitigate impacts to wetlands will be examined in the following order:

Use of traditional mitigation measures:
1) Avoid impacts by selecting alternative alignments or locations.
2) Reduce the impact by limiting encroachments, using less intrusive construction techniques, or other methods.
3) Restore the impact area to as near its original condition as possible.
4) In-kind replacement, on-site and within the right-of-way.

Use of the wetland bank:
5) In-kind replacement, off-site and within the right-of-way.
6) In-kind replacement, off-site and outside of the right-of-way.

Use of traditional mitigation measures:
7) Out-of-kind replacement, on-site and within the right-of-way.

Use of the wetland bank:
8) Out-of-kind replacement, off-site and within the right-of-way.
9) Out-of-kind replacement, off-site and outside of the right-of-way.

Right-of-way includes the roadway median, borrow sources, interchange areas, and along the roadside. A combination of mitigation strategies may be used if it is demonstrated they better mitigate for the impact than the use of a single strategy.

q. As a general rule, wetland bank sites offered as mitigation will be the same system, subsystem, and class as those impacted by development (i.e. in-kind replacement of palustrine, forested, wetlands will be accomplished by trading for the same).

r. Justification exists, at times, for mitigation to provide more or less than one acre of replacement land for each acre taken. Justification exists when 1:1 replacement, by area, is not a trade of equal value as measured by habitat units or average annual habitat units defined by US FWS Habitat Evaluation Procedures. This includes: when considerable time must pass before a bank site provides the wetland functional values provided by the impact site; when there are considerable differences in the initial quality of the impact site as compared to the bank site; and when the area impacted by a project extends beyond easily identified boundaries, such as the limits of fill.

s. The acceptability of a trade of greater size but lesser quality, or lesser size but greater quality than the impacted wetland shall be determined by agencies with a statutory interest, or an interest by mutual agreement, on a case by case basis.

t. Applications will be filed to obtain needed water rights, stream alteration permits, or similiar authorities from IDWR and other agencies.

5. Evaluation Methods:

a. A proper evaluation of wetland quality and quantity requires the use of standardized methods capable of producing repeatable results. The goal shall be to ensure that credits given to different sites are comparable.

b. Proper evaluation of an impact site and a wetland bank site may require all or some of the following:

- Evaluation of a proposed wetland banking site prior to enhancements.
- Evaluation of a wetland bank site at the time an exchange of credits is proposed.
- Evaluation of the impact site both pre- and post- construction.

c. The US ACE *Wetland Evaluation Technique* (WET) and the US FWS *Habitat Evaluation Procedures* (HEP) are appropriate tools to evaluate wetland quality, and a proposed trade involving unequal wetland qualities and quantities. Signatories to this agreement will develop a formal set of guidelines to best describe the application of HEP and other evaluation methods to the wetland bank.

d. The US ACE *Wetland Evaluation Technique* is recognized as an appropriate methodology to evaluate wetland functions and values including ground water recharge and discharge, flood storage and desynchronization, shoreline anchoring and dissipation of erosive forces, sediment trapping, nutrient retention and removal, food chain support, habitat for fish and wildlife, active and passive recreation and heritage value. The US FWS *Habitat Evaluation Procedures* is recognized as an appropriate methodology to evaluate fish and wildlife functions and values provided by wetlands. HEP will be the method to determine fish and wildlife values accrued over time.

e. Selected wetland bank sites and selected sites accepted as mitigation will be monitored to assess creation, restoration, and enhancement techniques and to evaluate the success of the wetland banking program. Signatories to this agreement will cooperate in the development of monitoring programs.

6. Record Keeping:

a. A sample record sheet is provided as an attachment to this document.

Attachment 1 - Sample Record Sheet

District #	County	Site/Project Name	Key #	USGS Quad Name	Township	Range	Section	Latitude	Longitude	Posting Date	Effective Date
1	Kootenai	Cougar Bay	NA	Coeur d'Alene, Idaho	T.50N.	R.4W.	15	47°41'00"	116°49'00"	2/6/87	2/6/87
1	Kootenai	Coeur d'Alene East	2343	Coeur d'Alene, Idaho	T.50N.	R.4W.	17	47°00'00"	116°42'00"	2/16/87	2/16/87

Wetland Bank Account Record of Activity as of 2/28/87 - Page 1

Attachment 1 - Sample Record Sheet

Transaction Description	Site Providing Credits for this Withdrawal	Transaction Amount	New Balance				
Credit - Establishment of new bank site	NA	32 acres	32 acres				
Withdrawal	Cougar Bay	12 acres	20 acres				

ATTACHMENT N-2

State of Washington
Executive Order EO 89-10, Protection of Wetlands

1889

STATE OF WASHINGTON
OFFICE OF THE GOVERNOR

OLYMPIA
98504-0413

BOOTH GARDNER
GOVERNOR

EXECUTIVE ORDER

EO 89-10

PROTECTION OF WETLANDS

WHEREAS, wetlands:

(A) provide, protect and preserve drinking water supplies by purifying surface water and ground water;

(B) provide a natural means of flood and storm damage protection through the absorption and storage of water during high runoff periods, thereby reducing flood crests and preventing loss of life and property;

(C) often serve as transition zones between dry land and water courses, thereby retarding soil erosion;

(D) provide essential breeding, spawning, rearing, feeding, nesting and wintering habitats for a major portion of the state's fish and wildlife;

(E) provide special vegetation and vegetative communities;

(F) maintain surface waters through the gradual release of stored flood waters and ground water, particularly during drought periods;

(G) provide readily accessible outdoor biophysical laboratories, living classrooms, and training and educational resources, and

(H) provide ecological as well as economic benefits; and

WHEREAS, more than fifty percent of the state's original wetlands have been drained, dredged, filled or otherwise altered; and

WHEREAS, over ninety percent of the original saltwater wetlands in some urban estuaries of Puget Sound have been eliminated; and

WHEREAS, wetlands losses statewide are as much as two thousand acres annually; and

WHEREAS, in urban areas in the state of Washington, freshwater wetlands losses are estimated at seventy-five acres per month or more than nine hundred acres per year; and

WHEREAS, the loss of wetlands often leads to economic and ecological harm of the state; and

WHEREAS, wetlands conservation is a matter of state concern, since wetlands of county may be affected by activities on rivers, lakes, streams, or wetlands of other counties and because they support migratory animal species which cross local government boundaries; and

WHEREAS, use of artificial structures, such as stormwater treatment systems, to provide wetlands functions and values may be more costly than protection of existing wetlands; and

WHEREAS, there is need for stronger state coordination to ensure wetlands protection;

NOW, THEREFORE, I, Booth Gardner, Governor of the State of Washington, by virtue of the power vested in me, do hereby order:

Section 1. It is the interim goal of my administration to achieve no overall net loss in acreage and function of Washington's remaining wetlands base. It is further the long-term goal to increase the quantity and quality of Washington's wetlands resource base.

Section 2. In the interest of preserving and protecting valuable resources, the Department of Ecology shall provide guidance and each affected state agency shall provide to the Governor an action plan, where appropriate, to lessen the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Section 3. Each affected state agency shall ensure that it avoids any activities t would adversely affect wetlands, and that unavoidable impacts are adequately mitiga

Section 4. To meet the long-term goal of this order, each affected state agency, in pursuing its agency mandate, should seek opportunities for voluntary wetlands restoration and creation of additional wetlands.

Section 5. In carrying out the intent of this order, each affected state agency shall consider the ecologic and hydrologic benefits provided by wetlands. Each affected state agency shall strive to prevent environmental and economic harm that results from continuing loss of wetlands, consistent with human health and safety and the general welfare of the state.

Section 6. Each affected state agency shall encourage sensitive site design and planning on a watershed basis, where appropriate, to avoid or minimize damage to wetlands.

Section 7. Each affected agency shall, when possible, direct its agency-mandated activities not dependent upon wetlands locations to suitable upland locations.

Section 8. Nothing in this Executive Order shall apply to assistance provided for emergency work that is essential to save lives and protect property and public health and safety.

1889

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the State of Washington to be affixed at Olympia this 11th day of December, A.D., nineteen hundred and eighty-nine.

Governor of Washington

BY THE GOVERNOR:

, ACTING DEPUTY
Secretary of State

ATTACHMENT N-3

State of Washington
Executive Order EO 90-04, Protection of Wetlands

STATE OF WASHINGTON
OFFICE OF THE GOVERNOR

OLYMPIA
98504-0413

BOOTH GARDNER
GOVERNOR

EXECUTIVE ORDER EO 90-04

PROTECTION OF WETLANDS

WHEREAS, wetlands provide ecological as well as economic benefits to the state by protecting and preserving drinking water supplies; by providing a natural means of flood and storm damage protection; by serving as transition zones between dry land and water courses, thereby retarding soil erosion; by providing essential breeding, spawning, rearing, feeding, nesting, and wintering habitats for fish and wildlife; by providing special vegetation and vegetative communities; by serving important functions for surface and groundwater supplies of the state; and by providing outdoor training and educational resources; and

WHEREAS, as much as fifty percent of the state's original wetlands have been drained, dredged, filled, or otherwise altered and over ninety percent of the original saltwater wetlands in some urban estuaries of Puget Sound have been eliminated; and

WHEREAS, losses statewide are as much as two thousand acres annually; and

WHEREAS, loss of wetlands harms the economic and ecological welfare of the state; and

WHEREAS, local governments are in the process of planning for growth and for the protection of critical areas, including wetlands; and

WHEREAS, wetlands are among the most fragile of natural resources and must be protected by state agencies in their stewardship of lands and waters subject to the public trust; and

WHEREAS, it is in the public interest to protect the functions and values of wetlands;

NOW, THEREFORE, I, Booth Gardner, Governor of the state of Washington, by virtue of the power vested in me, do hereby order:

Section 1. All state agencies shall rigorously enforce their existing authorities to assure wetlands protection;

Section 2. All state agencies shall exercise their substantive authority under the State Environmental Policy Act (SEPA), to the extent legally permissible, to require mitigation of wetlands impacts for all agency actions affecting wetlands. Such actions include, but are not limited to, rule development and any projects or actions requiring state licenses, permits, approvals, loans or grants. State agencies shall, when necessary, amend their SEPA policies to include wetlands protection components. The Department of Ecology, in its review of SEPA compliance documents, shall encourage and, to the extent legally permissible, require complete analyses of wetlands impacts, mitigation, and buffers;

Section 3. The Department of Ecology shall, to the extent legally permissible, exercise its authority under the Shoreline Management Act, to condition, deny, or appeal permits to assure wetlands protection. In addition, the Department of Ecology shall develop a model wetlands protection element for local governments to consider when amending shoreline master programs under the Shoreline Management Act;

Section 4. (a) The Department of Ecology shall request the Division Engineer of the Army Corps of Engineers to assert discretionary authority and modify nationwide permit 26 to require individual permits or permit conditions for certain categories of activities, types of wetlands and specific geographical regions. Examples include natural heritage sites, wetlands associated with shorelines of statewide significance, and recorded locations of threatened and endangered species. In these instances, actions affecting wetlands will no longer receive automatic authorization;

(b) The Department of Ecology shall evaluate and recommend future actions to reduce impacts to wetlands under the Federal Clean Water Act, such as further modifications to nationwide permit 26. The Department of Ecology shall reevaluate section 401 certification of nationwide permits affecting wetlands at such time as these permits are revised by the Army Corps of Engineers or when the existing certification expires in 1992, whichever comes first;

(c) The Department of Ecology, to the extent authorized by law, shall condition or deny water quality certifications under section 401 of the Federal Clean Water Act to prevent the degradation of wetlands;

Section 5. The Department of Ecology, in its triennial review of water quality standards, shall revise the standards to incorporate provisions specifically designed to better protect wetlands;

Section 6. The Departments of Wildlife and Fisheries shall fully implement the authority granted under the Hydraulics Code and, to the extent legally permissible, condition or deny permits to protect fish life by assuring wetlands protection;

Section 7. The Puget Sound Water Quality Authority shall continue its efforts to ensure full implementation of the wetlands elements of the Puget Sound Plan. All state agencies, within available resources, shall use their authorities to assist in implementing applicable portions of the Puget Sound Plan wetlands program;

Section 8. The Department of Agriculture shall develop a permit system for application of pesticides on or near wetlands by licensed applicators in order to assist in evaluating the type, amount, and impact of pesticides used in wetlands. The Department of Agriculture shall also develop a program to assess the amount of pesticides applied by non-licensed persons on or near wetland areas through required reporting of sales volume of pesticide products not requiring licensure for purchase;

Section 9. The Forest Practices Board, with assistance from the Department of Ecology, is encouraged to amend both the forest practices rules and the best management practices for forest practices to protect wetlands in a manner consistent with this executive order;

Section 10. The Department of Community Development shall adopt standards establishing wetlands protection criteria for administration and issuance of funds through its public works trust fund, community development block grant program, and housing trust fund; and the Department of Trade and Economic Development shall work with the Community Economic Revitalization Board (CERB) to develop and adopt wetlands protection criteria for administration and issuance of CERB loans and grants;

Section 11. The Department of Ecology shall give special consideration and allowance to those Centennial Clean Water Act grant proposals containing wetlands protection elements and shall condition any grant approvals to assure wetlands protection;

Section 12. All state agencies shall use the following definition of mitigation, in the following order of preference:

(1) Avoiding the impact altogether by not taking a certain action or part of an action;
(2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
(3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
(4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
(5) Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;
(6) Monitoring the impact and taking appropriate corrective measures;

Mitigation for individual actions may include a combination of the above measures;

Section 13. The Department of Ecology shall develop statewide policies and standards on wetlands rating systems, mitigation, buffers, restoration, and enhancement in consultation with other agencies and interested parties. These policies and standards shall be adopted to the extent legally permissible by all state agencies as part of their SEPA policies, and shall be applied where appropriate to all licenses, permits, approvals, grants and actions undertaken by state agencies;

Section 14. The Department of Ecology, in consultation with agencies and academic institutions with expertise, tribes, local governments, and other appropriate parties, shall coordinate wetlands inventory activities and develop inventory standards and strategies to standardize and maximize the efficiency and effectiveness of inventory efforts in the state;

Section 15. The Department of Ecology shall develop a wetlands impact assessment process in conjunction with the demonstration conservation plan required by RCW 90.54. The wetlands impact assessment process shall balance the public policies of wetlands protection and water use efficiency as set out in RCW 90.03. The Department of Ecology shall consult with other interested and affected parties, in order to assist in decision making regarding water use efficiency improvements and wetlands protection;

Section 16. The Department of Ecology shall provide technical assistance to the Department of Community Development in the development of wetlands protection policies and standards for the implementation of grants programs and to guide the development of local government comprehensive plans and development regulations under the growth management bill passed by the 1990 legislature;

Section 17. The Department of Ecology shall provide educational and technical assistance, within available resources, for local government implementation of the wetlands protection components of the Puget Sound Plan and wetlands protection components of the growth management bill passed by the 1990 legislature;

Section 18. All local governments in this state are requested and encouraged to make all of their actions consistent with the intent and goals of this executive order. The Department of Ecology, in consultation with local governments, shall develop a model local government wetlands protection ordinance, and shall initiate and administer a local grants program, as funding permits, for the development of local wetlands protection programs;

Section 19. All appropriate state agencies shall continue to develop and implement wetlands education and outreach activities and to inform public and private interests regarding the provisions of this order;

Section 20. (a) There is hereby established an Interagency Wetlands Review Board (Board) which shall consist of the directors or designees of the Department of Ecology, the Department of Fisheries, the Department of Wildlife, the Department of Agriculture, the Puget Sound Water Quality Authority, and the Department of Community Development. The Department of Transportation and the Department of Natural Resources are invited to become members of the Board. The representative of the Department of Ecology shall serve as chair and shall provide staff support when needed;

(b) The Board is empowered to develop means to implement and monitor agency compliance with this executive order. The Board shall submit regular reports to the Governor on actions taken under this order;

(c) The Board is authorized to ask for assistance from any department, office, division or agency of this state to supply data, personnel, or assistance as necessary to implement the directives of this executive order;

Section 21. Nothing in this executive order shall apply to assistance provided for emergency work that is essential to save lives or protect property and public health and safety.

1889

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the State of Washington to be affixed at Olympia this 21ST day of APRIL, A.D., nineteen hundred and ninety.

Governor of Washington

BY THE GOVERNOR:

Donald F. Whiting
Assistant Secretary of State

IMPLEMENTATION OF GOVERNOR'S EXECUTIVE ORDER

I. Identification of agency activities which potentially impact wetlands

- Potential adverse impacts. Examples: chemical control programs, fertilizer permit programs, expansion/reduction of wildlife habitat and public access areas, pesticide use in hatcheries, construction of hatcheries, siting of energy generating plants and transmission corridors, loans to cities/counties for infrastructure projects, hazardous waste siting and permitting, SEPA review, capital construction projects.

- Opportunities for enhancement. Examples: land acquisition programs, wetlands mitigation banks, vegetation planting, restoration of agency-owned land, use of "design with nature" concepts in facility design stage.

II. Adoption of procedures for avoiding impacts, minimization of unavoidable impacts, and compensation for unavoidable impacts.

III. Adoption of procedures for increasing quality and quantity of wetlands, where applicable.

IV. Adoption of procedures for monitoring agency implementation of Governor Executive Order.

V. Adoption of procedures for coordinating wetland-related activities with other agencies, where applicable.

ATTACHMENT N-4

State of Washington
Department of Wildlife Wetlands Policy

Department of Wildlife POL-3025

DATE: August 8, 1990

PAGE: 1 of 10

CANCELS:

SEE ALSO: POL-3000
POL-3001
EO 89-10
EO 90-4

Approved by:

POLICY Curt Smitch

POL-3025 WETLANDS

Wetlands are highly productive wildlife habitat that deserve special protection. The following policies apply to Department of Wildlife (WDW) construction projects and projects that WDW is reviewing through any of the regulatory processes.

1. Wetlands will be Given Special Protection

WDW adopts the goal of the Governor's Executive Order, the National Wetlands Policy Forum, and Puget Sound Water Quality Plan to ensure no net loss of wetland acreage, value or function and to develop a long-term net gain in the state's wetlands through restoration and enhancement. During planning and construction of WDW projects, special attention will be given to avoiding impacts to wetlands, their edges and buffers. Special attention to avoiding impacts to wetlands and their buffers will also be given during review and comment on environmental documents and in permit review and comment for private proposals. Unavoidable losses will be fully compensated. The first goal of wetland mitigation is avoidance of impact.

2. Wetlands are Defined by U. S. Fish and Wildlife Service

The U. S. Fish and Wildlife Service definition is the best scientific definition: "Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) At least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year." (Cowardin et al, 1979) In this definition, wetlands include streams, rivers, shallow waters of lakes, ponds, intertidal areas and shallow subtidal areas as well as marshes, bogs and swamps, wet meadows and similar habitats.

Environmental regulations on wetlands cover subsets of that. For example, the Hydraulic Project Approval (HPA) process covers waters of the state. It includes streams, lakes, and ponds to their ordinary high water mark. The Federal Clean Water Act includes the waters plus vegetated wetlands in its definition.

The wetland/upland boundary will be defined using the methodology agreed to by the Environmental Protection Agency, Corps of Engineers and Fish and Wildlife Service.

3. Mitigation is Defined in Governor's Executive Order 90-4

The definition of mitigation in EO 90-4 is essentially the same as the definition of mitigation in the State Environmental Policy Act rules, Hydraulic Act rules, and WDW mitigation policies (POL-3000).

(a) Avoiding the impact altogether by not taking a certain action or part of an action;

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;

(e) Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;

(f) Monitoring the impact and taking appropriate corrective measures..

The above order is the order of preference. Mitigation may include a combination of the above measures. Item (f) (Monitoring and Corrective Action) should be employed in all mitigation efforts.

Mitigation is sequenced so that compensation is employed only after avoidance and minimization of impact are incorporated to the greatest extent possible.

Wetland mitigation should include performance standards, evaluation of the success of mitigation for five years and modification or restoration at earliest opportunity to ensure success of mitigation.

4. Wetland Fills Will Only be Approved for Water Dependent Projects

In the review of U. S. Army Corps of Engineers' Section 404 permits, WDW will recommend against approval of fills that cause an alteration to wetlands unless Section 404 (b) (1) analysis demonstrates there is no practical alternative and the project is needed.

5. Wetland Degradation Will be Avoided and Acreage and Function Will be Preserved

WDW will only accept a loss of wetland area, function or value at a site when the loss is unavoidable (no alternative exists) and when any loss of wetland area, function and value is fully compensated. Compensation will be accepted as mitigation only after the proposal has been designed to minimize impacts to wetlands and adjacent uplands.

6. Wetland Compensation Will be Coordinated With Other Agencies

WDW will coordinate with the Environmental Protection Agency, U. S. Fish and Wildlife Service, National Marine Fisheries Service, Washington Department of Fisheries, Washington Department of Ecology, affected tribes and local governments to ensure WDW approved compensation is agreeable to all the resource agencies. WDW will work with other resource agencies to develop goals for wetland mitigation, monitoring and contingency plans.

7. Wetlands Will be Compensated at a Minimum of 2:1

For wetland compensation projects involving a Hydraulic Project Approval (HPA), a minimum of 2:1 compensation to impacted area shall be required. If 2:1 compensation is infeasible, written justification for the lesser compensation must accompany the draft HPA when it is returned to Olympia for processing.

For wetland compensation projects not involving an HPA, a minimum of 2:1 compensation shall be recommended to the permitting agency.

8. Off-Site Wetland Compensation Should Restore or Enhance Existing Hydraulics

In compensation projects, flood storage capacity and year-round surface water quantity should be restored and/or enhanced to preserve aquatic resource habitat. This is usually accomplished by keeping the compensation site in the same drainage basin as the original wetland when onsite compensation is not possible.

9. Native Plants are Preferred in Wetland Sites

The following native plants will be preferred in any wetland revegetation projects:

Marine and estuarine aquatic bed

- kelp (*Nereocystis luetkeana*, *Macrocystis integrifolia*, *Pterygophora californica*)
- sea lettuce (*Ulva lactuca*)
- eelgrass (*Zostera marina*)

Brackish and salt marsh

- arrowgrass (*Triglochin maritimum*)
- Lyngby's sedge (*Carex lyngbyei*)
- spike rush (*Eleocharis parvula*)
- American three-square bulrush (*Scirpus americanus*)
- salt marsh bulrush (*Scirpus maritimus*)
- hardstem bulrush (*Scirpus acutus*)
- tufted hairgrass (*Deschampsia caespitosa*)
- seaside plantain (*Plantago maritima*)
- salt grass (*Distichlis spicata*)
- pickleweed (*Salicornia virginica*)

Freshwater marshes

slough sedge (*Carex obnupta*)
small-fruited bulrush (*Scirpus microcarpus*)
spike rush (*Eleocharis palustris*)
Watson's willow herb (*Epilobium watsonii*)
cattail (*Typha latifolia*)
speedwell (*Veronica* spp.)
beaked sedge (*Carex rostrata*)
Sitka sedge (*Carex sitchensis*)
mint (*Mentha arvensis*)
cut-leaved water horehound (*Lycopus americanus*, *L. uniflora*)
angelica (*Angelica* spp.)
water parsley (*Oenanthe sarmentosa*)
cow parsnip (*Heracleum lanatum*)

Shallow freshwater ponds (both east and westside)

pondweed (*Potamogeton pectinatus*, *P. diversifolius*, *P. natans*, *P. robbinsii*, *P. richardsonii*)
arrowhead (*Sagittaria latifolia*)
smartweed (*Polygonium punctatum*, *P. amphibium*)
water shield (*Brasenia shreberi*)
Indian pond lily (*Nuphar polysepalum*, *N. variegatum*)
water club rush (*Scirpus subterminalis*)
hardstem bulrush (*Scirpus acutus*)
softstem bulrush (*Scirpus validus*)

Westside scrub/shrub

wetter sites:

willows (*Salix lasiandra*, *S. rigida*, *S. hookeriana*, *S. sitchensis*)
skunk cabbage (*Lystichum americanum*)
lady fern (*Athyrium filix-femina*)
red-osier dogwood (*Cornus stolonifera*)
salmonberry (*Rubis spectabilis*)

transitional areas:

ninebark (*Physocarpus capitatus*)
gooseberry (*Ribes lacustre*)
Indian plum (*Oemleria cerasiformis*)

cascara (*Rhamnus purshiana*)
snowberry (*Symphoricarpos albus*)
red elderberry (*Sambucus Racemosa*)
Oregon grape (*Berberis aquifolium*)

Eastside scrub/shrub wetland and riparian areas

Douglas hawthorn (*Crataegus douglasii* var. *douglasii*)
white alder (*Alnus rhombifolia*)
water birch (*Betula occidentalis*)
willows (*Salix lasiandra*, *S. exigua*, *S. amydaloides*)
red-osier dogwood (*Cornus stolonifera*)
black twinberry (*Lonicera involucrata*)
honeysuckle (*Lonicera utahensis*)
black cottonwood (*Populus trichocarpa*)

transitional areas:

black hawthorn (*Crategus douglasii*)
Columbia hawthorn (*C. columbania*)
bitter cherry (*Prunus emarginata* var.*emarginata*)
common chokecherry (*Prunus virginiana*)
wild rose (*Rosa gymnocarpa*, *R. woodsii*)
snowberry (*Symphoricarpos albus*)
serviceberry (*Amelanchier alnifolia*)
mock orange (*Philadephus lewisii*)
clematis (*Clematis ligusticifolia*)
blue elderberry (*Sambucus cerulea*)
golden current (*Ribes aureum*),
scouler's willow (*Salix scouleriana*)
ninebark (*Physocarpus malvaceus*)
syringa (*Philadelphus lewisii*)
hackberry (*Celtis reticulata*)
ocean spray (*Holodiscus discolor*)

Westside forested

black cottonwood (*Populus trichocarpa*)
Oregon ash (*Fraxinus oregana*)
lodgepole pine (*Pinus contorta*)
western red cedar (*Thuja plicata*)
Sitka spruce (*Picea sitchensis*)
red alder (*Alnus rubra*)
hemlock (*Tsuga heterophylla*)

Eastside forested

wetter sites:

black cottonwood (*Populus trichocarpa*)
mountain alder (*Alnus incana*)
white alder (*Alnus rhombifolia*)
water birch (*Betula occidentalis*)
red-osier dogwood (*Cornus stolonifera*)

transitional areas:

aspen (*Populus tremuloides*)
Oregon white oak (*Quercus garryana*)
ninebark (*Physocarpus malvaceus*)
ocean spray (*Holodiscus discolor*)
serviceberry (*Amelanchier alnifolia*)
wild rose (*Rosa gymnocarpa*, *R. woodsii*)
mock orange (*Philadelphus lewisii*)
clematis (*Clematis ligusticifolia*)
blue elderberry (*Sambucus cerulea*)
Oregon grape, tall (*Berberis aquifolium*)

Eastside emergent

false solomon seal (*Smilacina stellata*, *S. racemosa*)
monkey flower (*Mimulus guttatus*)
woolly sedge (*Carex lanuginosa*)
beaked sedge (*Carex rostrata*)
Nebraska sedge (*Carex nebrascensis*)
field sedge (*Carex praegracilis*)
common spike-rush (*Eleocharis palustris*)
hardstem bulrush (*Scirpus acutus*)
baltic rush (*Juncus balticus*)
three-square bulrush (*Scirpus americanus*)
softstem bulrush (*Scirpus validus*)
broadfruited burreed (*Sparganium eurycarpum*)
common cattail (*Typha latifolia*)

Eastside grasses

giant wildrye (*Elymus cinereus*)
tufted hairgrass (*Deschampsia cespitosa*)
wheatgrass (*Agropyron smithii*, *A. dasystachyum*)
fowl mannagrass (*Glyceria striata*)

Saline or alkaline areas, eastside

black greasewood (*Sarcobatus vermiculatus*)
alkali saltgrass (*Distichlis stricta*)
giant wildrye (*Elymus cinereus*)

Vernal Pond Vegetation

April - May:

Gray's desert parsley (*Lomatium grayi*)
narrowleaved montia (*Montia linearis*)

Mid-May to Mid-June:

Geyer's onion (*Allium geyeri*)
Navarretia (*Navarretia intertexta* var. *propinqua*)
close-flowered knotweed (*Polygonum confertifolium*)

Mid-June to Mid-July:

showy downingia (*Downingia elegans*)
alkali bluegrass (*Poa juncifolia*)
common spikerush (*Eleocharis palustris*)

Mid-July to early August

low gumweed (*Grindelia nana*)

Bog

sphagnum moss (*Sphagnum*)
Labrador tea (*Ledum groenlandicum*)
bog cranberry (*Vaccinium oxycoccos*)
bog laurel (*Kalmia occidentalis*)

Westside riparian areas

willows (*Salix* sp.)
snowberry (*Symphoricarpos albus*)
vine maple (*Acer circinatum*)
red-osier dogwood (*Cornus stolonifera*
wild rose (*Rosa nutkana*)
ocean spray (*Holodiscus discolor*)
hazelnut (*Corylus cornuta*)
tall Oregon grape (*Berberis aquifolium*)
Oregon myrtle (*Umbellularia californica*
red elderberry (*Sambucus racemosa* var. *aborescens*)
ninebark (*Physocarpus capitatus*)

serviceberry (*Amelanchier alnifolia*)
mock orange (*Philadelphus lewisii*)
huckleberry (*Vaccinium ovatum*, *V. parvifolium*)
hawthorn (*Crataegus douglassi* var. *douglasii*
red alder (*Alnus rubra*)
moosewood (*Viburnum edule*)
black cottonwood (*Populus trichocarpa*)
western red cedar (*Thuja plicata*)
blue elderberry (*Sambucus cerulea*)
big leaf maple (*Acer macrophyllum*)

Agricultural riparian areas

cattail (*Typha latifolia*)
willows (*Salix* sp.)
wild rose (*Rosa nutkana*)

10. Exotic Plants Will be Discouraged in Wetlands

The following exotic plant species invade native plant communities and shall be discouraged in wetlands. Existing stands of these plants will be restored to native plant communities whenever possible:

reed canarygrass (*Phalaris arundinacea*)
purple loosestrife (*Lythrum salicaria*)
Russian olive (*Elaeagnus angustifolia*)
smooth cordgrass (*Spartina alterniflora*, *Spartina angelica*, *Spartina patans*)
Eurasian water milfoil (*Myriophyllum spicatum*)

Note: reed canarygrass may be used to control the spread of purple loosestrife or other noxious weeds and prevent erosion, if no acceptable native plant material can be found.

11. Adjacent Uplands Will be Protected and Restored

WDW will recommend that buffers and connectors be retained and restored around wetlands. This will be accomplished during environmental review and permitting and during compensation and restoration efforts. Recommended buffers will be mature native vegetation when possible. The buffer zones will be large enough to preserve important edge habitat and protect primary breeding and feeding areas from adjacent land uses. They should be designed to connect to other wetlands, aquatic systems or forested areas whenever possible.

The U. S. Fish and Wildlife Service's Habitat Evaluation Procedures (HEP) Models demonstrate the value of upland adjacent to wetlands for the following guild species: muskrat, trout and salmon, lesser scaup and mallard, beaver, blue heron, black brant, mink, wood duck and red-winged blackbird.

Native vegetation in uplands adjacent to wetlands will be protected to ensure diversity of plant and animal communities. It will be designed to meet life needs of priority species and others that depend upon the wetland/riparian zone for primary breeding and feeding and cover needs. It will also be designed to provide sufficient canopy cover, large organic debris, snags and downed timber, interspersion, and vertical and horizontal edge diversity.

12. Detrimental Uses of Wetlands Will be Discouraged

Use of wetlands or their buffers for housing or urban development will be strongly discouraged. The use of existing wetlands and buffers for urban stormwater or wastewater treatment will be strongly discouraged. Stormwater should be treated in grassy swales and oil/gas separators prior to discharge into wetlands or their buffers. Urban wastewater and stormwater may be treated in artificial wetlands created for that purpose.

Conversion of wetland buffers to recreational facilities will be discouraged. Peat mining in wetlands dominated by native plants will be discouraged.

13. Consideration Shall be Given to Enhancing Wetlands

In any WDW project involving a wetland, consideration shall be given to enhancing the wetland to increase functional value. Examples of this include: planting native vegetation, removing exotic plants, increasing the size or diversity of the wetland system, or restoring disturbed portions. Areas with existing high value will not be altered (sphagnum peat bogs, for example).

May 16, 1990 Revised 7/20/90

DEPARTMENT OF WILDLIFE COMPLIANCE WITH EXECUTIVE ORDER 89-10, 90-04

PROTECTION OF WETLANDS

I. Policy Statement
   See attached DRAFT POLICIES

II. Identification
   A. Adverse Impact Assessment (Activities with Potential Adverse Impacts to One or more Wetland Functions)

      1) Wildlife Area/Habitat Development
         a) Road construction for public access.
         b) Bridge construction for access.
         c) Maintaining parking areas (includes herbicide application).
         d) Crop production (herbicide application).
         e) Grazing.
         f) Stabilizing stream banks with riprap.
         g) Erosion control/planting non-native plants.
         h) Converting one wetland type to another.
         i) Stream impoundments.*
         j) Encouraging public use or access.
         k) Filling to create islands.*
         l) Dredging wetlands to provide more open water.*
         m) Undertaking action to respond to animal damage complaints (beaver dam removal).

* Note: These activities may increase habitat and biologic diversity and result in overall increases in wildlife value but could affect some loss of one type of wetland.

      2) Fishery Enhancement
         a) Hatchery construction.
         b) Use of sloughs as fish rearing facilities.
         c) Use of springs as hatchery water source.
         d) Treating lakes and streams with rotenone to kill off undesirable fishes and replant with harvestable fishes.
         e) Increased recreation on lakes and streams.
         f) Lake and stream damming.
         g) Herbicide application for aquatic plant control.

    h) Draining impoundments for maintenance.

3) Permits and Environmental Review
    a) Incomplete wetland protection because of limited statutory authority under Hydraulic Project Approval, Water Rights, Section 10 and 404 of Clean Water Act, review of lake herbicide applications, Forest Practice Application.

    b) Insufficient staff to review all SEPA documents discussing potential impacts to wetlands and field review all permits, and be present at public hearings, and monitor results of mitigation.
    c) Habitat alterations on mitigation lands to benefit targeted species.
    d) Designing compensation based upon targeted species rather than fully replacing all lost functional values.

4) Engineering and Construction Activities
    a) Hatchery, lab, boat launch and access area construction.
    b) Pesticide and chemical use to restrict weeds at public access areas.
    c) Non-chemical maintenance activity such as culvert clean out.

B) Assessment of Opportunities for Wetlands Preservation, Enhancement, Restoration and Creation as Funding Permits

1) In construction activities, excavating gravel from areas with high water tables to create open water wetlands; revegetating the shoreline.

2. Acquisition of threatened, high value wetlands using dedicated funding source or surplus property.

3. Use of funds to build islands, increase edge and vegetation/open water interspersion and diversity.

4. Create wetlands by impounding drainage.

5. Acquire high value wetlands available from Farmers Home Administration (farms that have foreclosed).

6. Revegetating degraded wetlands.
7. Breaching dikes on certain Department lands to return wetlands to full function.
8. Working with landowners to restore degraded wetlands.
9. Inventorying wetlands on Department Lands (as funding allows).
10. Educating interested publics (Sports clubs, Environmental groups, local planning departments) on the functions and values of wetlands through brochure, slide shows, and talks and field walks.
11. Develop educational programs for schools.
12. Revise Agency SEPA WACs to include as much use of the Substantive effect of the Act to protect wetlands.
13. Review Hydraulic Project Approval WACs to see if it is possible to revise WACs to ensure wetlands protection where wetlands or their buffers provide a direct or indirect benefit for fish.
14. Develop a one and five year mitigation monitoring report form.
15. Develop a wetland impact and opportunity checklist to evaluate projects that may impact wetlands.
16. Develop with Department of Ecology and Soil Conservation Service a brochure on wetland/buffer restoration for land managers and owners.
17. Dedicated funds are used to acquire or enhance wetlands with high waterfowl potential. Other preservation opportunities including work with Wildlife and Recreation Coalition, Interagency Committee for Outdoor Recreation, The U.S. Fish and Wildlife Service, The US Park Service, Puget Sound Water Quality Authority-Department of Ecology done to identify and acquire wetlands and protect them and their buffers through non-regulatory opportunities.

III. Implementation

1. Adoption of attached Agency Wetland Policies
   Completion Date: September 30, 1990
   Contact: Hal Beecher, Bob Zeigler 753-3188.

2. Development of Wetland Impact and Opportunity Evaluation form to be attached to SEPA environmental checklist and circulated to agencies with jurisdiction and interested persons. Note: In event the proposal that would affect wetlands is exempt from SEPA, the completed evaluation form will be sent to Department of Ecology's wetland section a minimum of 15 days prior to permits being issued for Department of Wildlife proposals.
   Completion Date: September 30, 1990
   Contact: Bob Zeigler, 753-3188

3. Add three field biologists to provide additional wetlands protection through permit and State Environmental Policy Act review and monitor success on target wetlands.
   Initiation Date: July 1, 1990
   Completion Date: On going
   Contact: David Mudd/Hal Beecher, 753-3318.

3. Wetlands Inventory on Department Owned Lands that is standardized with other statewide efforts using the Cowardin classification and National Wetland Inventory maps.

   Initiation Date: July 1, 1990
   Completion Date: On going as funding allows.
   Contact: Maureen Beckstead, 753-5728

4. Develop Wetland Mitigation Monitoring Forms to determine success after one and five years.
   Completion Date: September 1, 1990
   Contact: Bob Zeigler, 753-3188

5. SEPA and Hydraulic Project Approval WAC Revision.
   Completion Date: July 1, 1992
   Contact: David Mudd, 753-3318

6. Serve on Interagency Wetlands Review Board.
   Completion Date: Ongoing, as staff and funding allow.

Contact: Chris Drivdahl, 753-3188

7. Serve Ecology Advisory Committee
   Completion Date: Ongoing
   Contact: Hal Beecher/Bob Zeigler, 753-3188

8. Adopt in Policy:

   a) Wetland definition: US Fish and Wildlife Service with wetland upland edge defined using adopted Federal methodology. Regulations on wetlands cover differing subsets of that. For example, HPA covers waters of the state. It includes streams, lakes, ponds to their ordinary high water mark while Clean Water Act includes vegetated wetlands in its definition. The wetland/upland boundary will be defined using the agreed Federal Methodology.
   b) Mitigation sequencing as defined in Executive Order 90-04.
   c) Future mitigation policies and standards at least as stringent as those developed under Section 13 of E.O. 90-04.

   Note: Success of mitigation will be monitored for 5 years and requiring or performing restoration to meet stated mitigation objectives (as funding allows).

   c) Develop a Wetland Buffer Policy to protect wetland function and values and provide vegetated connectors between wetlands that are sufficient in depth to maintain primary breeding and feeding habitat for wetland/riparian species and priority habitat for priority species. Once buffer standards are developed under Section 13 of E.O. 90-04, agency's buffer standards will be reviewed and revised, if need be, to be at least as stringent.
   d) Once Department of Ecology has adopted rating system policies and standards, agency will review policies and revise, if necessary, to ensure agency's policies are at least as stringent.

   Initiation Date: August 1, 1990
   Completion Date: Ongoing
   Contact: Bob Zeigler, 753-3188

9. Develop with Department of Ecology and Soil Conservation Service, a brochure on what plants to use, where they may be available, and habitat requirements for restoration of wetlands and buffers.
   Initiation Date: May 18, 1990
   Completion Date: July 1, 1991
   Contact: Bob Zeigler 753-3318.

10. Preservation Opportunities. Use Duck Stamp and Print monies to acquire and enhance high value waterfowl wetlands. Use other funding sources to when available to preserve at risk lands through acquisition and easement.
    Initiation Date: currently in operation
    Completion Date: On going
    Contact: Don Kraege, 586-2758, Bob Zeigler, 753-3188.

12. Prepare annual report to the Governor's Office on compliance with the plan, tasks completed, major milestones, problem issues and needed revisions to the plan.
    Initiation Date: August 1, 1990
    Completion Date: June 30, each year
    Contact: Hal Beecher, 753-3318
    Bob Zeigler, 753-3188

ATTACHMENT N-5

State of Washington
Model Wetlands Protection Ordinance

MODEL
WETLANDS PROTECTION
ORDINANCE

Department of Ecology
September 1990

MODEL WETLAND PROTECTION ORDINANCE

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MODEL WETLAND PROTECTION ORDINANCE

Section 1: Findings of Fact and Purpose

1.1 Findings of Fact

The [City Council or Board of Commissioners] of the [local jurisdiction] hereby finds that:

a. Wetlands and their buffer areas are valuable and fragile natural resources with significant development constraints due to flooding, erosion, soil liquefaction potential, and septic disposal limitations.

b. In their natural state, wetlands provide many valuable social and ecological services, including:

    1) controlling flooding and stormwater runoff by storing or regulating natural flows;
    2) protecting water resources by filtering out water pollutants, processing biological and chemical oxygen demand, recycling and storing nutrients, and serving as settling basins for naturally occurring sedimentation;
    3) providing areas for groundwater recharge;
    4) preventing shoreline erosion by stabilizing the substrate;
    5) providing habitat areas for many species of fish, wildlife, and vegetation, many of which are dependent on wetlands for their survival, and many of which are on Washington State and Federal Endangered Species lists;
    6) providing open space and visual relief from intense development in urbanized area;
    7) providing recreation opportunities; and
    8) serving as areas for scientific study and natural resource education.

c. Development in wetlands results in:

    1) increased soil erosion and sedimentation of downstream water bodies, including navigable channels;
    2) increased shoreline erosion;
    3) degraded water quality due to increased turbidity and loss of pollutant removal processes;
    4) elimination or degradation of wildlife and fisheries habitat;
    5) loss of fishery resources from water quality degradation, increased peak flow rates, decreased summer low flows, and changes in the streamflow regimen.
    6) loss of stormwater retention capacity and slow-release detention resulting in flooding, degraded water quality, and changes in the streamflow regimen of watersheds;
    7) loss of groundwater recharge areas;

d. Buffer areas surrounding wetlands are essential to maintenance and protection of wetland functions and values. Buffer areas protect wetlands from degradation by:

   1) stabilizing soil and preventing erosion;
   2) filtering suspended solids, nutrients and harmful or toxic substances;
   3) moderating impacts of stormwater runoff;
   4) moderating system microclimate;
   5) protecting wetland wildlife habitat from adverse impacts;
   6) maintaining and enhancing habitat diversity and/or integrity;
   7) supporting and protecting wetlands plant and animal species and biotic communities; and
   8) reducing disturbances to wetland resources caused by intrusion of humans and domestic animals.

e. The loss of the social and ecological services provided by wetlands results in a detriment to public safety and welfare; replacement of such services, if possible at all, can require considerable public expenditure.

f. A considerable acreage of these important natural resources has been lost or degraded by draining, dredging, filling, excavating, building polluting, and other acts inconsistent with the natural uses of such areas. Remaining wetlands are in jeopardy of being lost, despoiled, or impaired by such acts.

It is therefore necessary for the [local unit of government] to ensure maximum protection for wetland areas by discouraging development activities in wetlands and those activities at adjacent sites that may adversely affect wetland functions and values, to encourage restoration and enhancement of already degraded wetland systems, and to encourage creation of new wetland areas.

1.2 Purpose

It is the policy of the [local unit of government] to require site planning to avoid or minimize damage to wetlands wherever possible; to require that activities not dependent upon a wetland location be located at upland sites; and to achieve no net loss of wetlands by requiring restoration or enhancement of degraded wetlands or creation of new wetlands to offset losses that are unavoidable.

In addition, it is the intent of the [local unit of government] that activities in or affecting wetlands not threaten public safety, cause nuisances, or destroy or degrade natural wetland functions and values by:

a. Impeding flood flows, reducing flood storage capacity, or impairing natural flood control functions, thereby resulting in increased flood heights, frequencies, or velocities on other lands;

b. increasing water pollution through location of domestic waste disposal systems in wetlands; unauthorized application of pesticides and herbicides; disposal of solid waste at inappropriate sites; creation of unstable fills; or the destruction of wetland soils and vegetation;

c. increasing erosion;

d. decreasing breeding, nesting, and feeding areas for many species of waterfowl and shorebirds, including those rare and endangered;

e. interfering with the exchange of nutrients needed by fish and other forms of wildlife;

f. decreasing habitat for fish and other forms of wildlife;

g. adversely altering the recharge or discharge functions of wetlands, thereby impacting groundwater or surface water supplies;

h. significantly altering wetland hydrology and thereby causing either short-or long-term changes in vegetational composition, soils characteristics, nutrient cycling, or water chemistry;

i. destroying sites needed for education and scientific research, such as outdoor biophysical laboratories, living classrooms, and training areas;

j. interfering with public rights in navigable waters and the recreation opportunities provided by wetlands for fishing, boating, hiking, birdwatching, photography and other passive uses; or

k. destroying or damaging aesthetic and property values, including significant public viewsheds.

The purposes of this chapter are to protect the public health, safety and welfare by preventing the adverse environmental impacts of development enumerated in Section 1 of this chapter, and by:

a. Preserving, protecting and restoring wetlands by regulating development within them and their buffers;

b. Protecting the public against losses from:

    1. unnecessary maintenance and replacement of public facilities, including the dredging of ports and navigation channels;

2. publicly funded mitigation of avoidable impacts;

3. cost for public emergency rescue and relief operations; and

4. potential litigation from improper construction practices authorized for wetland areas;

c. Alerting appraisers, assessors, owners, and potential buyers or lessees to the development limitations of wetlands;

d. Providing [local unit of government] officials with information to evaluate, approve, condition, or deny public or private development proposals;

e. Adopting Governor Booth Gardner's interim goal to achieve no overall net loss in acreage and functions of Washington's remaining wetland base and the long-term goal to increase the quantity and quality of Washington's wetland resource base;

f. Implementing the policies of the Growth Management Act, the State Environmental Policy Act, Chapter 43.21C RWC, Puget Sound Water Quality Management Plan, Washington State Executive Order 90-04, [relevant local plans, policies and ordinances], and all other present and future [local unit of government] functional, environmental and community plans and programs.

Section 2: Definitions

For the purposes of this chapter, the following definitions shall apply:

a. "Applicant" means a person who files an application for permit under this chapter and who is either the owner of the land on which that proposed activity would be located, a contract vendee, a lessee of the land, the person who would actually control and direct the proposed activity, or the authorized agent of such a person.
b. "Best management practices" means conservation practices or systems of practices and management measures that:
1) Control soil loss and reduce water quality degradation caused by nutrients, animal waste, toxics, and sediment; and
2) Minimize adverse impacts to surface water and groundwater flow, circulation patterns, and to the chemical, physical, and biological characteristics of wetlands.
c. "Compensation project" means actions necessary to replace project-induced wetland and wetland buffer losses, including land acquisition, planning, construction plans, monitoring and contingency actions.
d. "Compensatory mitigation" means replacing project-induced wetland losses or impacts, and includes, but is not limited to, the following:

1) "Restoration" - Actions performed to reestablish wetland functional characteristics and processes which have been lost by alterations, activities, or catastrophic events within an area which no longer meets the definition of a wetland.
2) "Creation" - Actions performed to intentionally establish a wetland at a site where it did not formerly exist.
3) "Enhancement" - Actions performed to improve the condition of existing degraded wetlands so that the functions they provide are of a higher quality.

e. "Critical habitat" means habitat necessary for the survival of endangered, threatened, rare, sensitive or monitor species.

f. "Developable Area" means an area of land outside of wetlands and wetland buffers.

g. "Department" means the Washington state department of ecology.

h. "Emergent wetland" means a regulated wetland with at least 30 percent of the surface area covered by erect, rooted, herbaceous vegetation as the uppermost vegetative strata.

i. "Exotic" means any species of plants or animals that are foreign to the planning area.

j. "Existing and ongoing agriculture" includes those activities conducted on lands defined in RCW 84.34.020(2), and those activities involved in the production of crops or livestock, for example, the operation and maintenance of farm and stock ponds or drainage ditches, operation and maintenance of ditches, irrigation systems including irrigation laterals, canals, or irrigation drainage ditches, changes between agricultural activities, and normal maintenance, repair, or operation of existing serviceable structures, facilities, or improved areas. Activities which bring an area into agricultural use are not part of an ongoing operation. An operation ceases to be ongoing when the area on which it is conducted is converted to a nonagricultural use or has lain idle for more than five years, unless the idle land is registered in a federal or state soils conservation program, or unless the activity is maintenance of irrigation ditches, laterals, canals, or drainage ditches related to an existing and ongoing agricultural activity. Forest practices are not included in this definition.

k. "Extraordinary hardship" means strict application of this chapter and/or programs adopted to implement this chapter by the [Approval Authority] would prevent all reasonable economic use of the parcel.

l. "Forested wetland" means a regulated wetland with at least 20 percent of the surface area covered by woody vegetation greater than 20 feet in height.

m. Functions," "beneficial functions," or "functions and values" means the beneficial roles served by wetlands including, but not limited to, water quality protection and enhancement, fish and wildlife habitat, food chain support, flood storage, conveyance and attenuation, groundwater recharge and discharge, erosion control, wave attenuation, historical and archaeological and aesthetic value protection, and recreation. These beneficial roles are not listed in order of priority.

n. "High intensity land use" includes land uses which are associated with moderate or high levels of human disturbance or substantial wetland habitat impacts including, but not limited to, medium and high density residential, multifamily residential, active recreation, and commercial and industrial land uses.

o. "High quality wetlands" are those regulated wetlands which meet the following criteria:

1) No, or isolated, human alteration of the wetland topography;
2) No human-caused alteration of the hydrology or else the wetland appears to have recovered from the alteration;
3) Low cover and frequency of exotic plant species;
4) Relatively little human-related disturbance of the native vegetation, or recovery from past disturbance;
5) If the wetland system is degraded, it still contains a viable and high quality example of a native wetland community; and
6) No known major water quality problems.

p. "Hydric Soil" means a soil that is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part. The presence of hydric soil shall be determined following the methods described in the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands".

q. "Hydrophytic vegetation" means macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. The presence of hydrophytic vegetation shall be determined following the methods described in the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands".

r. "In-kind compensation" means to replace wetlands with substitute wetlands whose characteristics closely approximate those destroyed or degraded by a regulated activity. It does not mean replacement "in-category."

s. "Isolated wetlands" means those regulated wetlands which:

1) are outside of and not contiguous to any 100-year floodplain of a lake, river, or stream; and
2) have no contiguous hydric soil or hydrophytic vegetation between the wetland and any surface water.

t. "Low intensity land use" includes land uses which are associated with low levels of human disturbance or low wetland habitat impacts, including, but not limited to, passive recreation, open space, or agricultural os forest management land uses.

u. "Mitigation" includes avoiding, minimizing or compensating for adverse wetland impacts. Mitigation, in the following order of preference is:

1) Avoiding the impact altogether by not taking a certain action or parts of an action;
2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
3) Rectifying the impact by repairing, rehabilitating or restoring the affected environment;

4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
5) Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;
6) Monitoring the impact and the compensation project and taking appropriate corrective measures. Mitigation for individual actions may include a combination of the above measures.

v. "Native Vegetation" means plant species which are indigenous to the area in question.

w. "Offsite compensation" means to replace wetlands away from the site on which a wetland has been impacted by a regulated activity.

x. "Onsite compensation" means to replace wetlands at or adjacent to the site on which a wetland has been impacted by a regulated activity.

y. "Out-of-kind compensation" means to replace wetlands with substitute wetlands whose characteristics do not closely approximate those destroyed or degraded by a regulated activity. It does not refer to replacement "out-of-category."

z. "Practicable alternative" means an alternative that is available and capable of being carried out after taking into consideration cost, existing technology, and logistics in light of overall project purposes, and having less impacts to regulated wetlands. It may include an area not owned by the applicant which could reasonably have been or be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity.

aa. "Puget Sound" means all salt waters of the state of Washington inside the international boundary line between the State of Washington and the province of British Columbia, lying east of one hundred twenty-three degrees, twenty-four minutes west longitude.

bb. "Regulated wetlands," means ponds twenty acres or less, including their submerged aquatic beds, and those lands defined as wetlands under the federal clean water act, 33 u.s.c. Sec. 1251 et seq., and rules promulgated pursuant thereto and shall be those areas and those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Regulated wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands created as mitigation and wetlands modified for approved land use activities shall be considered as regulated wetlands. All category I wetlands shall be considered regulated wetlands. Regulated wetlands do not include category II and III wetlands less than 2,500 square feet and category IV wetlands less than 10,000 square feet. Regulated wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities. The applicant shall bear the burden of proving that the site was not previously a wetland. For identifying and delineating a regulated wetland, local government shall consider the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands".

cc. "Regulated Activities" means any of the following activities which are directly undertaken or originate in a regulated wetland or its buffer:

1) The removal, excavation, grading, or dredging of soil, sand, gravel, minerals, organic matter, or material of any kind;
2) The dumping, discharging, or filling with any material;
3) The draining, flooding, or disturbing of the water level or water table;
4) The driving of pilings;
5) The placing of obstructions;
6) The construction, reconstruction, demolition, or expansion of any structure;
7) The destruction or alteration of wetlands vegetation through clearing, harvesting, shading, intentional burning, or planting of vegetation that would alter the character of a regulated wetland, provided that these activities are not part of a forest practice governed under chapter 76.09 RCW and its rules; or
8) Activities that result in a significant change of water temperature, a significant change of physical or chemical characteristics of wetlands water sources, including quantity, or the introduction of pollutants.

dd. "Repair or maintenance" means an activity that restores the character, scope, size, and design of a serviceable area, structure, or land use to its previously authorized and undamaged condition. Activities that change the character, size, or scope of a project beyond the original design and drain, dredge, fill, flood, or otherwise alter additional regulated wetlands are not included in this definition.

ee. "Scrub-shrub wetland" means a regulated wetland with at least 30 percent of its surface area covered by woody vegetation less than 20 feet in height as the uppermost strata.

ff. "Serviceable" means presently useable.

gg. "Unavoidable and necessary impacts" are impacts to regulated wetlands that remain after a person proposing to alter regulated wetlands has demonstrated that no practicable alternative exists for the proposed project.

hh. "Water-dependent" means requiring the use of surface water that would be essential to fulfill the purpose of the proposed project.

ii" "Wetlands," for the purposes of inventory, incentives, and nonregulatory programs, means those lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For the purposes of this definition, wetlands must have one or more of the following attributes:

1) At least periodically, the land supports predominantly hydrophytes;
2) The substrate is predominantly undrained hydric soil; and
3) The substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

jj. "Wetland buffers" or "wetland buffer zones" is an area that surrounds and protects a wetland from adverse impacts to the functions and values of a regulated wetland.
kk. "Wetland classes," "classes of wetlands" or "wetland types" means descriptive classes of the wetlands taxonomic classification system of the United States fish and wildlife service (Cowardin, et al 1978).
ll. "Wetlands permit" means any permit issued, conditioned or denied specifically to implement this chapter.
mm. "Wetland edge" means the boundary of a wetland as delineated based on the definitions contained in this chapter.

Section 3: General Provisions

3.1 Abrogation and Greater Restrictions

It is not intended that this chapter repeal, abrogate, or impair any existing regulations, easements, covenants, or deed restrictions. However, where this chapter imposes greater restrictions, the provisions of this chapter shall prevail.

3.2 Interpretation

The provisions of this chapter shall be held to be minimum requirements in their interpretation and application and shall be liberally construed to serve the purposes of this chapter.

Section 4: Lands to Which this Chapter Applies

4.1. Applicability

a. When any provision of any other chapter of the [local unit of government] conflicts with this chapter, that which provides more protection to wetlands and wetland buffers shall apply unless specifically provided otherwise in this chapter.

b. The [Approval Authority is authorized to adopt written procedures for the purpose of carrying out the provisions of this chapter. Prior to fulfilling the requirements of this chapter, [local unit of government] shall not grant any approval or permission to conduct a regulated activity in a wetland or wetland buffer including but not limited to the following:
[list all applicable permits and approvals, which may include the following: building permit, commercial or residential; binding site plan; conditional use permit; franchise right-of-way construction permit; grading and clearing permit; master plan development; planned unit development; right-of-way permit; shoreline substantial development permit; shoreline variance; shoreline conditional use permit; shoreline environmental redesignation; unclassified use permit; variance; zone reclassification; subdivision; short subdivision; special use permit; utility and other use permit; zone reclassification]; or any subsequently adopted permit or required approval not expressly exempted by this chapter.

Section 4.2. Maps and Inventory
This chapter shall apply to all lots or parcels on which wetlands and/or wetland buffers are located within the jurisdiction of [local unit of government]. The approximate location and extent of wetlands in the [local unit of government] is displayed on [Name of local government map or National Wetlands Inventory]. The [Name of local government map or National Wetlands Inventory] is to be used as a guide to the general location and extent of wetlands. Wetlands not shown on the [Name of local government map or National Wetlands Inventory] are presumed to exist in the [local unit of government] and are protected under all the provisions of this chapter. In the event that any of the wetland designations shown on the maps conflict with the criteria set forth in this chapter the criteria shall control.

Section 4.3 Determination of Regulatory Wetland Boundary
The exact location of the wetland boundary shall be determined by the applicant through the performance of a field investigation applying the wetland definition provided in Section 2 of this chapter. Qualified professional and technical scientists shall perform wetland delineations using the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands". The applicant is required under Section 6.3.c of this chapter to show the location of the wetland boundary on a scaled drawing as a part of the permit application.

The [Approval Authority], when requested by the applicant, may waive the delineation of boundary requirement for the applicant and, in lieu of delineation by the applicant, perform the delineation. The [Approval Authority] shall consult with qualified professional scientists and technical experts or other experts as needed to perform the delineation. The applicant may be charged for the costs incurred in accordance with the provisions of Section 6.3.d of this chapter.

Where [Approval Authority] performs a wetland delineation at the request of the applicant, such delineation shall be considered a final determination.

Where the applicant has provided a delineation of the wetland boundary, the [Approval Authority] shall verify the accuracy of, and may render adjustments to, the boundary delineation. In the event the adjusted boundary delineation is contested by the applicant, the [Approval Authority] shall, at the applicant's expense, obtain expert services to render a final delineation.

4.4 Wetlands Rating System
The following [Washington State or Puget Sound Region] rating system is hereby adopted as the rating system for the [local unit of government]. Wetlands buffer widths, replacement ratios and avoidance criteria shall be based on these rating systems.

a. Washington State Four-tier Wetlands Rating System.

1) Category I Criteria
   A. Documented habitat for endangered or threatened fish or animal species or for potentially extirpated plant species recognized by state or federal agencies; or
   B. High quality native wetland communities, including documented category I or II quality Natural Heritage wetland sites and sites which qualify as a category I or II quality Natural Heritage wetland; or
   C. High quality, regionally rare wetland communities with irreplaceable ecological functions, including sphagnum bogs and fens, estuarine, wetlands, or mature forested swamps; or
   D. Wetlands of exceptional local significance. The criteria for such a designation shall be developed and adopted by the local jurisdiction under appropriate public review and administrative appeal procedures. The criteria may include, but not be limited to, rarity, groundwater recharge areas, significant habitats, unique educational sites or other specific functional values within a watershed or other regional boundary.

2) Category II Criteria
   A. Regulated wetlands that do not contain features outlined in category I; and
   B. Documented habitats for sensitive plant, fish or animal species recognized by federal or state agencies; or
   C. Rare wetland communities listed in subsection 1)C which are not high quality; or
   D. Wetland types with significant functions which may not be adequately replicated through creation or restoration.
   E. Regulated wetlands with significant habitat value based on diversity and size.
   F. Regulated wetlands contiguous with salmonid fish-bearing waters, including streams where flow is intermittent; or
   G. Regulated wetlands with significant use by fish and wildlife.

3) Category III Criteria
   A. Regulated wetlands that do not contain features outlined in category I, II or IV.

4) Category IV Criteria
   A. Regulated wetlands which do not meet the criteria of a category I or II wetland; and
   B. Isolated wetlands that are less than or equal to one acre in size; and have only one wetland class; and have only one dominant plant species (monotypic vegetation); or
   C. Isolated wetlands that are less than or equal to two

acres in size, and have only one wetland class and a predominance of exotic species.

b. Puget Sound Region Wetlands Rating System

1) Category I Criteria

A. Documented habitat for endangered or threatened plant, fish, or animal species or for potentially extirpated plant species recognized by state or federal agencies; or

B. High quality native wetland communities, including documented category I or II quality Natural Heritage wetland sites and sites which qualify as a category I or II quality Natural Heritage wetland; or

C. High quality, regionally rare wetland communities with irreplaceable ecological functions, including sphagnum bogs and fens, estuarine, wetlands, or mature forested swamps; or

D. Wetlands of exceptional local significance. The criteria for such a designation shall be developed and adopted by the local jurisdiction under appropriate public review and administrative appeal procedures. The criteria may include, but not be limited to, rarity, groundwater recharge areas, significant habitats, unique educational sites or other specific functional values within a watershed or other regional boundary.

2) Category II Criteria

A. Regulated wetlands that do not contain features outlined in category I; and

B. Documented habitats for sensitive plant, fish or animal species recognized by federal or state agencies; or

C. Rare wetland communities listed in subsection 1)C which are not high quality; or

D. Wetland types with significant functions which may not be adequately replicated through creation or restoration. In the Puget Sound planning area, these wetlands may be demonstrated by the following characteristics:

i. significant peat systems; or

ii. forested swamps that have three canopy layers, excluding monotypic stands of red alder averaging 8 inches diameter at breast height or less; or

iii. significant spring fed systems;

E. Wetlands with significant habitat value based on diversity and size.

i. 10 acres or greater in size; and 2 or more wetland classes together with open water at any time during a normal year; or

ii. 10 acres or greater in size; and 3 or more wetland classes; and 5 or more subclasses of vegetation in a dispersed pattern; or

iii. 5 acres or greater in size; and 40 percent to 60 percent open water at any time during a normal year; and 2 or more subclasses of vegetation in a dispersed pattern;

F. Regulated wetlands contiguous with salmonid fish-bearing waters, including streams where flow is intermittent; or

G. Wetlands with significant use by fish and wildlife.

3) Category III Criteria

A. Regulated wetlands that do not contain features outlined in category I, II or IV.

4) Category IV Criteria

A. Regulated wetlands which do not meet the criteria of a category I or II wetland; and

B. Isolated wetlands that are less than or equal to one acre in size; and have only one wetland class; and have only one dominant plant species (monotypic vegetation); or

C. Isolated wetlands that are less than or equal to two acres in size, and have only one wetland class and a predominance of exotic species.

c. Wetland rating categories shall be applied as the regulated wetland exists on the date of adoption of the rating system by the local government; as the regulated wetland may naturally change thereafter; or as the regulated wetland may change in accordance with permitted activities. wetland rating categories shall not be altered to recognize illegal modifications.

d. Procedures for applying the wetland rating system. Reserved (NOTE: Ecology's procedures for applying the wetland rating system uniformly will be available in July 1991.)

Section 5: Regulated Activities and Allowed Activities

5.1 Regulated Activities

A permit shall be obtained from local government prior to undertaking the following activities in a regulated wetland or its buffer unless authorized by Section 5.2 below:

a. The removal, excavation, grading, or dredging of soil, sand, gravel, minerals, organic matter, or material of any kind;
b. The dumping, discharging, or filling with any material;
c. The draining, flooding, or disturbing of the water level or water table;
d. The driving of pilings;
e. The placing of obstructions;
f. The construction, reconstruction, demolition, or expansion of any structure;
g. The destruction or alteration of wetlands vegetation

through clearing, harvesting, shading, intentional burning, or planting of vegetation that would alter the character of a regulated wetland, provided that these activities are not part of a forest practice governed under chapter 76.09 RCW and its rules; or

h. Activities that result in a significant change of water temperature, a significant change of physical or chemical characteristics of wetlands water sources, including quantity, or the introduction of pollutants.

5.2 Allowed Activities

The following uses shall be allowed within a wetland or wetland buffer to the extent that they are not prohibited by any other chapter or law and provided they are conducted using best management practices, except where such activities result in the conversion of a regulated wetland or wetland buffer to a use to which it was not previously subjected and provided further that forest practices and conversions shall be governed by Chapter 76.09 RCW and its rules:

a. Conservation or preservation of soil, water, vegetation, fish, shellfish, and other wildlife;

b. Outdoor recreational activities, including fishing, birdwatching, hiking, boating, horseback riding, swimming, canoeing, and bicycling;

c. The harvesting of wild crops in a manner that is not injurious to natural reproduction of such crops and provided the harvesting does not require tilling of soil, planting of crops, or alteration of the wetland by changing existing topography, water conditions or water sources;

d. Existing and ongoing agricultural activities including farming, horticulture, aquaculture, irrigation, ranching or grazing,of animals. Activities on areas lying fallow as part of a conventional rotational cycle are part of an ongoing operation. Activities which bring an area into agricultural use are not part of an ongoing operation. An operation ceases to be ongoing when the area on which it was conducted has been converted to another use or has lain idle so long that modifications to the hydrological regime are necessary to resume operations.

e. The maintenance (but not construction) of drainage ditches;

f. Education, scientific research, and use of nature trails;

g. Navigation aids and boundary markers;

h. Boat mooring buoys;

i. Site investigative work necessary for land use application submittals such as surveys, soil logs, percolation tests and other related activities. In every case, wetland impacts shall be minimized and disturbed areas shall be immediately restored; and

j. The following uses are allowed within wetlands and/or wetland buffers provided that written notice at least ten days prior to the commencement of such work has been given to the [Approval Authority] and provided that wetland impacts are minimized and that disturbed areas are immediately restored:

1) Normal maintenance, repair, or operation of existing serviceable structures, facilities, or improved areas. Maintenance and repair does not include any modification that changes the character, scope, or size of the original structure, facility, or improved area and does not include the construction of a maintenance road and

2) Minor modification of existing serviceable structures within a buffer zone where modification does not adversely impact wetland functions.

5.3 Special Permit Uses

Any activity other than those specified in Section 5.2 may not be conducted in wetlands or wetland buffers except upon issuance of a Wetland Permit by the [Approval Authority].

Section 6. Procedures for Wetland Permits

6.1 Permit Requirements, Compliance

Except as specifically provided in Section 5.2, no regulated activity shall occur or be permitted to occur within a regulated wetland or wetland buffer without a written permit from the [Approval Authority]. Any alteration approved by such written permit shall comply fully with the requirements and purposes of this chapter, other applicable regulations, and any terms or conditions of said permit. All activities that are not allowed or permitted shall be prohibited.

6.2 Wetland Permits, Extensions

Application for a Wetland Permit to conduct any regulated activity not specifically authorized by Section 5.2 within a wetland or wetland buffer shall be made to the [Approval Authority] on forms furnished by that office. Permits shall normally be valid for a period of three years from the date of issue and shall expire at the end of that time unless a longer or shorter period is specified by the [Approval Authority] upon issuance of the permit.

An extension of an original permit may be granted upon written request to the [Approval Authority] by the original permit holder or the successor in title. Prior to the granting of an extension, the [Approval Authority] shall require updated studies and/or additional hearings if, in its judgement, the original intent of the permit is altered or enlarged by the renewal, if the circumstances relevant to the review and issuance of the original permit have changed substantially, or if the applicant failed to abide by the terms of the original permit.

6.3 Permit Applications

a. Request for Determination of Applicability
Any person seeking to determine whether a proposed activity or an area is subject to this chapter may request in writing a determination from the [Approval Authority]. Such a request for determination shall contain plans, data, and other information as may be specified by the [Approval Authority).

b. Pre-permit Consultations
Any person intending to apply for a Wetland Permit is strongly encouraged, but not required, to meet with the [Approval Authority) during the earliest possible stages of project planning in order to discuss wetland impact avoidance and minimization, and compensation before large commitments have been made to a particular project design. Effort put into preapplication consultations and planning will help applicants create projects which will be more quickly and easily processed.

c. Information Requirements
Unless the [Approval Authority] waives one or more of the following information requirements, applications for a Wetland Permit under this chapter shall include:

1) A description and maps overlaid on an aerial photograph at a scale no smaller than 1"=400' showing the entire parcel of land owned by the applicant and the exact boundary pursuant to Section 4.3 of the wetland on the parcel;
2) A description of the vegetative cover of the wetland and adjacent area including dominant species;
3) A site plan for the proposed activity overlaid on an aerial photograph at a scale no smaller than 1"=400' showing the location, width, depth and length of all existing and proposed structures, roads, sewage treatment, and installations within the wetland and its buffer;
4) The exact sites and specifications for all regulated activities including the amounts and methods;
5) Elevations of the site and adjacent lands within the wetland and its buffer at contour intervals of no greater than 5 feet;
6) Top view and typical cross-section views of the wetland

and its buffer to scale;
7) The purposes of the project and an explanation why the proposed activity cannot be located at other sites including an explanation of how the proposed activity is dependent upon wetlands or water-related resources as described in Section 7.2 of this chapter; and
8) Specific means to mitigate any potential adverse environmental impacts of the applicant's proposal.

The [Approval Authority] may require additional information, including, but not limited to, an assessment of wetland functional characteristics, including a discussion of the methodology used; documentation of the ecological, aesthetic, economic, or other values of a wetland; a study of flood, erosion, or other hazards at the site and the effect of any protective measures that might be taken to reduce such hazards; and any other information deemed necessary to verify compliance with the provisions of this chapter or to evaluate the proposed use in terms of the purposes of this chapter. The [Approval Authority] shall maintain and make available to the public, all information applicable to any wetland and its buffer.

d. Filing Fees

At the time of an application or request for letter of delineation, the applicant shall pay a filing fee as determined by the [Approval Authority]. Sufficient fees shall be charged to the applicant to cover the costs of evaluation of the application or request for delineation. These fees may be used by the [Approval Authority] to retain expert consultants to provide services pertaining to wetland boundary determinations, functional assessments, and evaluation of mitigation measures. As deemed necessary by the [Approval Authority], the [Approval Authority] may assess additional reasonable fees as needed to monitor and evaluate permit compliance and mitigation measures.

e. Notification

Upon receipt of the completed permit application, the [Approval Authority] shall notify the individuals and agencies, including federal and state agencies, having jurisdiction over or an interest in the matter to provide such individuals and agencies an opportunity to comment.

The [Approval Authority) shall establish a mailing list of all interested persons and agencies who wish to be notified of such applications.

f. Notice on Title

1) The owner of any property with field verified presence of wetland or wetland buffer pursuant to Section 4.3 on which a development proposal is submitted shall file for record with the appropriate Records Division a notice approved by the

[Approval Authority] in a form substantially as set forth in (2), below. Such notice shall provide notice in the public record of the presence of a wetland or wetland buffer, the application of this chapter to the property, and that limitations on actions in or affecting such wetlands and their buffers may exist.

The applicant shall submit proof that the notice has been filed for record before the [local unit of government] shall approve any development proposal for such site. The notice shall run with the land and failure to provide such notice to any purchaser prior to transferring any interest in the property shall be in violation of this chapter.

(NOTE: The form for such a notice may shall be developed and adopted by the local jurisdiction under appropriate administrative guidelines or rule procedures)

2) Form of Notice:

WETLAND AND/OR WETLAND BUFFER NOTICE

Legal Description: ______________________________________

____

____

Present owner: ______________________________________

NOTICE: This property contains wetlands or their buffers as defined by [local unit of government] Ordinance. The property

was the subject of a development proposal for ______________

(type of permit) ______ application # ____________________

filed on (date) . Restrictions on use or alteration of the wetlands or their buffers may exist due to natural conditions of the property and resulting regulations. Review of such application has provided information on the location of wetlands or wetland buffers and restrictions on their use through setback areas. A copy of the plan showing such setback areas is attached hereto.

____
Signature of owner

STATE OF WASHINGTON)
COUNTY OF __________)

On this day personally appeared before me to me known to be the individual(s) described in and who executed the within and foregoing instrument and acknowledged that they signed the same as their free and voluntary act and deed for the uses and purposes therein stated.

Given under my hand and official seal this _______ day of ____ , ____. NOTARY PUBLIC in and for the state of Washington, residing at ____.

6.4 Permit Processing

a. Consolidation
The [Approval Authority] shall, to the extent practicable and feasible, consolidate the processing of wetlands related aspects of other [local unit of government] regulatory programs which affect activities in wetlands, such as subdivision, clearing and grading, floodplain, and environmentally sensitive chapter, etc., with the Wetland Permit process established herein so as to provide a timely and coordinated permit process.

b. Completeness of Application
No later than 10 working days after receipt of the permit application the [Approval Authority] shall notify the applicant as to the completeness of the application. An application shall not be deemed complete until and unless all information necessary to evaluate the proposed activity, its impacts, and its compliance with the provisions of this chapter have been provided to the satisfaction of the [Approval Authority]. Such determination of completeness shall not be construed as an approval or denial of the permit application.

(NOTE: It is not intended that every permit application be processed through a Public hearing. Local governments may wish to establish various levels of review, including administrative review, for projects depending on the potential impact of different project types on wetlands.)

c. Public Hearings
Following the submittal of an application determined to be complete by the [Approval Authority], the [Approval Authority shall hold a public hearing on the application, unless the [Approval Authority] finds that the activity is so minor as to not affect a wetland or wetland buffer. The [Approval Authority] shall, at least fifteen (15) days prior to the date of the hearing, confirm that the applicant has:

1) published a notice of the hearing at least once a week on the same day of the week for two consecutive weeks in a newspaper having a general circulation in the [local jurisdiction];

2) given notice to the latest recorded real property owners as shown by the records of the county assessor within at least three hundred feet of the boundary of the property upon which the regulated activity is proposed; and
3) posted a notice at the proposed site of activity and at public places of assembly near the site of the proposed activity.

The notices shall include a brief description of the project, including the location; notice of the time and place of the hearing; notice that the file regarding the permit application is available for public inspection during regular business hours; the address where the file may be inspected; a request for written comments prior to the hearing, and attendance and oral testimony by concerned parties at the hearing.

All hearings shall be open to the public. A record of the hearings shall be made. Any person may present evidence and testimony at the hearing. At the hearing, the applicant shall have the burden of demonstrating that the proposed activity will be in accordance with the purposes of this chapter and the standards set forth below.

d. Permit Action

1) Upon receipt of a complete application for a permit authorizing activities on a category I wetland or its buffer, local governments shall submit the application to the Washington State Department of Ecology for its review and comment. When such permit applications are submitted, the Washington State Department of Ecology should submit its comments or should request an extension of the review period within 30 days. Extensions may be up to 30 days in length. When submitted, no permit shall be issued under this subsection prior to receipt of such comments or the expiration of the time period or any extension.

2) The [Council, Board, or Commission] shall approve, approve with conditions, or deny a permit application within (30) working days of the public hearing, except that where additional information is required by the [Council, Board, or Commission], it may extend this period by 60 days. In acting on the application, the [Council, Board, or Commission] shall in writing deny, permit, or conditionally permit the proposed activity. If a decision must be made in a 90 day period and there is insufficient information or time to process the application, a denial will be issued.

Section 7: Standards for Permit Decisions

a. A permit shall only be granted if the permit, as conditioned, is consistent with the provisions of this chapter. Additionally, permits shall only be granted if:

1) A proposed action avoids adverse impacts to regulated wetlands or their buffers or takes affirmative and appropriate measures to minimize and compensate for unavoidable impacts;
2) The proposed activity results in no net loss; or
3) Denial of a permit would cause an extraordinary hardship on the applicant.

b. Wetlands permits shall not be effective and no activity thereunder shall be allowed during the time provided to file a permit appeal.

7.1 Wetland Buffers

a. Standard Buffer Zone Widths
Wetland buffer zones shall be required for all regulated activities adjacent to regulated wetlands. Any wetland created, restored or enhanced as compensation for approved wetland alterations shall also include the standard buffer required for the category of the created, restored, or enhanced wetland. All buffers shall be measured from the wetland boundary as surveyed in the field pursuant to the requirements of Section 2. The width of the wetland buffer zone shall be determined according to wetland category and the proposed land use.

1) Category I	
High intensity	300 feet
Low intensity	200 feet
2) Category II	
High intensity	200 feet
Low intensity	100 feet
3) Category III	
High intensity	100 feet
Low intensity	50 feet
4) Category IV	
High intensity	50 feet
Low intensity	25 feet

(NOTE: These buffer ranges have been established to reflect the impact of intense and uses on wetland functions and values. If local jurisdictions choose to adopt a single standard buffer width from within these ranges additional criteria should be added which will result in a reduction or increase in the standard based on landuse intensity and its impact on existing habitat values.)

b. Increased Wetland Buffers Zone Width
The [Approval Authority] shall require increased standard buffer zone widths on a case-by-case basis when a larger buffer is necessary to protect wetlands functions and values based on local conditions. This determination shall be supported by appropriate documentation showing that it is reasonably related to protection of the functions and values of the regulated wetland. Such determination shall be attached as a permit condition and shall demonstrate that:
1) a larger buffer is necessary to maintain viable populations of existing species; or
2) the wetland is used by species proposed or listed by the federal government or the state as endangered, threatened, rare, sensitive or monitor, critical or outstanding potential habitat for those species or has unusual nesting or resting sites such as heron rookeries or raptor nesting trees; or
3) the adjacent land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse wetland impacts; or
4) the adjacent land has minimal vegetative cover or slopes greater than 15 percent.

c. Reduction of Standard Wetland Buffer Zone Width
The [Approval Authority] may reduce the standard wetland buffer zone widths on a case-by-case basis where it can be demonstrated that:
1) the adjacent land is extensively vegetated and has less than 15 percent slopes and that no direct or indirect, short - term or long-term, adverse impacts to regulated wetlands, as determined by the [Approval Authority], will result from a regulated activity. The [Approval Authority] may require long-term monitoring of the project and subsequent corrective actions if adverse impacts to regulated wetlands are discovered; or
2) the project includes a buffer enhancement plan using native vegetation which substantiates that an enhanced buffer will improve the functional attributes of the buffer to provide additional protection for wetlands functions and values. An enhanced buffer shall not result in greater than a 25 percent reduction in the buffer width, and the reduced buffer shall not be less than 25 feet.

d. Standard Wetland Buffer Width Averaging
Standard wetland buffer zones may be modified by averaging buffer widths. Wetland buffer width averaging shall be allowed only where the applicant demonstrates all of the following:
1)that averaging is necessary to avoid an extraordinary hardship to the applicant caused by circumstances peculiar to the property;
2)that the wetland contains variations in sensitivity due to existing physical characteristics;
3)that low intensity land uses would be located adjacent to

areas where buffer width is reduced, and that such low intensity land uses are guaranteed in perpetuity by covenant, deed restriction, easement, or other legally binding mechanism;
4)that width averaging will not adversely impact the wetland functional values; and
5)that the total area contained within the wetland buffer after averaging is no less than that contained within the standard buffer prior to averaging. In no instance shall the buffer width be reduced by more than 50% of the standard buffer or be less than 25 feet.

e. Except as otherwise specified, wetland buffer zones shall be retained in their natural condition. Where buffer disturbance has occurred during construction, revegetation with native vegetation may be required.

f. Permitted Uses in a Wetland Buffer Zone
Regulated activities shall not be allowed in a buffer zone except for the following:
1) activities having minimal adverse impacts on buffers and no adverse impacts on regulated wetlands. These may include low intensity, passive recreational activities such as pervious trails, nonpermanent wildlife watching blinds, short term scientific or educational activities, and sports fishing or hunting;
2) with respect to category III and IV wetlands, stormwater management facilities having no reasonable alternative on-site location; or
3) with respect to category III and IV wetlands, development having no feasible alternative location.

g. Building Setback Lines.
A building setback line of 15 feet is required from the edge of any wetland buffer. Minor structural intrusions into the area of the building setback may be allowed if the [Approval Authority] determines that such intrusions will not negatively impact the wetland. The setback shall be identified on a site plan which is filed as an attachment to the notice on title required by section 6.2.f.

7.2 Avoiding Wetland Impacts

a. Regulated activities shall not be authorized in a regulated wetland except where it can be demonstrated that the impact is both unavoidable and necessary or that all reasonable economic uses are denied.

b. With respect to category I wetlands, an applicant must demonstrate that denial of the permit would impose an extraordinary hardship on the part of the applicant brought about by circumstances peculiar to the subject property.

c. With respect to category II and III wetlands, the following provisions shall apply:
1) For water-dependent activities, unavoidable and necessary impacts can be demonstrated where there are no practicable alternatives which would not involve a wetland or which would not have less adverse impact an a wetland, and would not have other significant adverse environmental consequences.
2) Where nonwater-dependent activities are proposed, it shall be presumed that adverse impacts are avoidable. This presumption may be rebutted upon a demonstration that:
   A. the basic project purpose cannot reasonably be accomplished utilizing one or more other sites in the general region that would avoid, or result in less, adverse impact on a regulated wetland; and
   B. a reduction in the size, scope, configuration, or density of the project as proposed and all alternative designs of the project as proposed that would avoid, or result in less, adverse impact on a regulated wetland or its buffer will not accomplish the basic purpose of the project; and
   C. in cases where the applicant has rejected alternatives to the project as proposed due to constraints such as zoning, deficiencies of infrastructure, or parcel size, the applicant has made reasonable attempt to remove or accommodate such constraints.

d. With respect to category IV wetlands, unavoidable and necessary impacts can be demonstrated where the proposed activity is the only reasonable alternative which will accomplish the applicant's objectives.

e. Reasonable Use
If an applicant for a development proposal demonstrates to the satisfaction of the [Approval Authority] that application of these standards would deny all reasonable economic use of the property, development as conditioned shall be allowed if the applicant also demonstrates all of the following to the satisfaction of the [Approval Authority):

   i. that the proposed project is water-dependent or requires access to the wetland as a central element of its basic function, or is not water-dependent but has no practicable alternative pursuant to Section 7.2;

   ii. that no reasonable use with less impact on the wetland and its buffer is possible (e.g., agriculture, aquaculture, transfer or sale of development rights or credits, sale of open Space easements, etc.);

   iii. that there is no feasible on-site alternative to the proposed activities, including reduction in density, phasing of project implementation, change in timing of activities, revision of road and lot layout, and/or related site planning considerations, that would allow a reasonable economic use with less adverse impacts to wetlands and wetland buffers;

iv. that the proposed activities will result in minimum feasible alteration or impairment to the wetland's functional characteristics and its existing contours, vegetation, fish and wildlife resources, and hydrological conditions;

v. that disturbance of wetlands has been minimized by locating any necessary alteration in wetland buffers to the extent possible;

vi. that the proposed activities will not jeopardize the continued existence of endangered, threatened, rare, sensitive, or monitor species as listed by the federal government or the State of Washington;

vii. that the proposed activities will not cause significant degradation of groundwater or surface-water quality;

viii. that the proposed activities comply with all state, local and federal laws, including those related to sediment control, pollution control, floodplain restrictions, and on-site wastewater disposal;

ix. that any and all alterations to wetlands and wetland buffers will be mitigated as provided in Section 7.5.g.

x. that there will be no damage to nearby public or private property and no threat to the health or safety of people on or off the property; and

xi. that the inability to derive reasonable economic use of the property is not the result of actions by the applicant in segregating or dividing the property and creating the undevelopable condition after the effective date of this chapter.

If the [Approval Authority] determines that alteration of a wetland and/or wetland buffer is necessary and unavoidable, the [Approval Authority] shall set forth in writing in the file it maintains regarding a permit application its findings with respect to each of the items listed in this subsection.

4) With respect to category IV wetlands, unavoidable and necessary impacts can be demonstrated where the proposed activity is the only reasonable alternative which will accomplish the applicant's objectives.

7.3 Minimizing Wetlands Impacts

a. After it has been determined by the [Approval Authority] pursuant to Section 7.2 that losses of wetland are necessary and unavoidable or that all reasonable economic use has been denied, the applicant shall take deliberate measures to minimize wetland impacts.

b. Minimizing impacts to wetlands shall include but is not limited to:
1) limiting the degree or magnitude of the regulated activity;
2) limiting the implementation of the regulated activity;
3) using appropriate and best available technology;
4) taking affirmative steps to avoid or reduce impacts;
5) sensitive site design and siting of facilities and construction staging areas away from regulated wetlands and their buffers;
6) involving resource agencies early in site planning; and
7) providing protective measures such as siltation curtains, hay bales and other siltation prevention measures, scheduling the regulated activity to avoid interference with wildlife and fisheries rearing, resting, nesting or spawning activities.

7.4 Limited Density Transfer

For development proposals on lands containing wetland buffers, the [Approval Authority] shall determine allowable dwelling units for residential development proposals based on the formulas below.

The following formula for density calculations is designed to provide incentives for the preservation of wetlands and wetland buffers, flexibility in design, and consistent treatment of different types of development proposals. The formula shall apply to all properties within existing residential zones on which wetlands and wetland buffers are located.

The maximum number of dwelling units (DU) for a lot or parcel which contains wetlands and wetland buffers shall be equal to:
(Acres in Wetland Buffer)(DU/Acre)(Density Credit)

The density credit figure is derived from the following table:

Percentage of site in buffers	Density Credit
1-10%	100%
11-20%	90%
21-30%	80%
31-40%	70%
41-50%	60%
51-60%	50%
61-70%	40%

71-80%	30%
81-90%	20%
91-99%	10%

The density credit can only be transferred within the development proposal site. To the extent that application of the formula may result in lot sizes less than the minimum allowed by the underlying district, they are hereby authorized provided that the resultant lot is of sufficient size for a on-site waste disposal system if no sanitary sewer system exists.

The [Approval Authority] shall not allow credit for density for the portions of the site occupied by wetlands.

7.5 Acting on the Application

a. Special Use Permit Conditions

1) Sensitive Area Tracts

As a condition of any permit issued pursuant to this chapter, the permit holder shall be required to create a separate sensitive area tract or tracts containing the areas determined to be wetland and/or wetland buffer in field investigations performed pursuant to Section 4.3 Sensitive area tracts are legally created tracts containing wetlands and their buffers that shall remain undeveloped in perpetuity. Sensitive area tracts are an integral part of the lot in which they are created, are not intended for sale, lease or transfer, and shall be included if the area of the parent lot for purposes of subdivision method and minimum lot size.

A. Protection of Sensitive Area Tracts

The [Approval Authority] shall require, as a condition of any permit issued pursuant to this chapter, that the sensitive area tract or tracts created pursuant to Section 7.5.a be protected by one of the following methods:

i. The permit holder shall convey an irrevocable offer to dedicate to the [local unit of government] or other public or non-profit entity specified by the [Approval Authority] an easement for the protection of native vegetation within a wetland and/or its buffer or

ii. The permit holder shall establish and record a permanent and irrevocable deed restriction on the property title of all lots containing a sensitive area tract or tracts created as a condition of this permit. such deed restriction(s) shall prohibit in Perpetuity the development, alteration, or disturbance of vegetation within the sensitive area tract except for purposes of habitat enhancement as part of an enhancement project which has received prior written approval from [local unit of government], and any other agency with jurisdiction over such activity.

(NOTE: The following is is suggested language)

2) The deed restriction shall also contain the following language:

A. "Before beginning and during the course of any grading, building construction, or other development activity on a lot or development site subject to this deed restriction, the common boundary between the area subject to the deed restriction and the area of development activity must be fenced or otherwise marked to the satisfaction of [local unit of government]."

B. Regardless of the legal method of protection chosen by the [Approval Authority], responsibility for maintaining tracts shall be held by a homeowners association, adjacent lot owners, the permit applicant or designee, or other appropriate entity as approved by the [Approval Authority].

C. The following note shall appear on the face of all plats, short plats, PUDS, or other approved site plans containing separate sensitive area tracts, and shall be recorded on the title of record for all affected lots:

NOTE: All lots adjoining separate sensitive area tracts identified as Native Vegetation Protection Easements or protected by deed restriction are responsible for maintenance and protection of the tracts. Maintenance includes insuring that no alterations occur within the separate tract and that all vegetation remains undisturbed unless the express written authorization of the [local unit of government) has been received.

The common boundary between a separate sensitive area tract and the adjacent land must be permanently identified. This identification shall include permanent wood or metal signs on treated or metal posts. Signs shall be worded as follows:

"Protection of this natural area is in your care. Alteration or disturbance is prohibited by law. Please call the [Approval Authority] for more information."

Sign locations and size specifications shall be approved by the [Approval Authority]. The [Approval Authority] shall require permanent fencing of the sensitive area tract or tracts when there is a substantial likelihood of the presence of domestic grazing animals within the development proposal. The [Approval Authority] shall also require as a permit condition that such fencing be provided if, subsequent to approval of the development proposal, domestic grazing animals are in fact introduced.

3) Additional Conditions

A. The location of the outer extent of the wetland buffer and the areas to be disturbed pursuant to an approved permit shall be marked in the field, and such field marking shall be approved by the [Approval Authority) prior to the commencement of permitted activities. Such field markings shall be maintained throughout the duration of the permit.

B. The [Approval Authority] may attach such additional conditions to the granting of a special use permit as deemed necessary to assure the preservation and protection of affected wetlands and to assure compliance with the purposes and requirements of this chapter.

b. Bonding

1) Performance Bonds

The [Approval Authority] shall require the applicant of a development proposal to post a cash performance bond or other security acceptable to the [Approval Authority] in an amount and with surety and conditions sufficient to fulfill the requirements of Section 7.5.f and, in addition, to secure compliance with other conditions and limitations set forth in the permit. The amount and the conditions of the bond shall be consistent with the purposes of this chapter. In the event of a breach of any condition of any such bond, the [Approval Authority] may institute an action in a court of competent jurisdiction upon such bond and prosecute the same to judgement and execution. The [Approval Authority] shall release the bond upon determining that:

A. all activities, including any required compensatory mitigation, have been completed in compliance with the terms and conditions of the permit and the requirements of this chapter;

B. upon the posting by the applicant of a maintenance bond.

Until such written release of the bond, the principal or surety cannot be terminated or canceled.

2) Maintenance Bonds

The [approval Authority] shall require the holder of a development permit issued pursuant to this chapter to post a cash performance bond or other security acceptable to the

[Approval Authority] in an amount and with surety and conditions sufficient to guarantee that structures, improvements, and mitigation required by the permit or by this chapter perform satisfactorily for a minimum of two (2) years after they have been completed. The [Approval Authority] shall release the maintenance bond upon determining that performance standards established for evaluating the effectiveness and success of the structures, improvements, and/or compensatory mitigation have been satisfactorily met for the required period. For compensation projects, the performance standards shall be those contained in the mitigation plan developed and approved during the permit review process pursuant to Section 7.5.g. The maintenance bond applicable to a compensation project shall not be released until the [Approval Authority determines that performance standards established for evaluating the effect and success of the project have been met.

c. Other Laws and Regulations
No permit granted pursuant to this chapter shall remove an applicant's obligation to comply in all respects with the applicable provisions of any other Federal, State, or local law or regulation, including but not limited to the acquisition of any other required permit or approval.

d. Suspension, Revocation
In addition to other penalties provided for elsewhere, the [Approval Authority] may suspend or revoke a permit if it finds that the applicant or permittee has not complied with any or all of the conditions or limitations set forth in the permit, has exceeded the scope of work set forth in the permit, or has failed to undertake the project in the manner set forth in the approved application.

e. Publication of Notice
The [Approval Authority] shall cause notice of its denial, issuance, conditional issuance, revocation, or suspension of a permit to be published in a daily newspaper having a broad circulation in the area wherein the wetland lies. Such notice shall be published within five (5) working days of the decision or order and shall include at least the following:

1) A brief description of the project, including location;

2) The decision or order of the [Approval Authority] with respect to the project;

3) Notification that the permit file is open for public inspection during regular business hours, and the address where such file may be inspected; and

4) A statement of the procedures regarding appeal or judicial review of the decision, if applicable.

f. Compensating for Wetlands Impacts.

As a condition of any permit allowing alteration of wetlands and/or wetland buffers, or as an enforcement action pursuant to Section 8.2, the [Approval Authority] shall require that the applicant engage in the restoration, creation or enhancement of wetlands and their buffers in order to offset the impacts resulting form the applicant's or violator's actions. The Applicant shall develop a plan that provides for land acquisition, construction, maintenance and monitoring of replacement wetlands that recreate as nearly as possible the original wetlands in terms of acreage, function, geographic location and setting, and that are larger than the original wetlands. The overall goal of any compensatory project shall be no net loss of wetlands function and acreage and to strive for a net resource gain in wetlands over present conditions. Compensation shall be completed prior to wetland destruction, where possible.

Compensatory mitigation shall follow an approved mitigation plan pursuant to Section 7.5.g and shall meet the following minimum performance standards:

1) Given the uncertainties in scientific knowledge and the need for expertise and monitoring, wetland compensatory projects may be permitted only when the [Approval Authority] finds that the compensation project is associated with an activity or development otherwise permitted and that the restored, created, or enhanced wetland will be as persistent as the wetland it replaces. Additionally, Applicants shall:

A. demonstrate sufficient scientific expertise, supervisory capability, and financial resources to carry out the project;
B. demonstrate the capability for monitoring the site and to make corrections during this period if the project fails to meet projected goals; and
C. protect and manage or provide for the protection and management of the compensation area to avoid further development or degradation and to provide for long-term persistence of the compensation area.

2) Wetlands Restoration and Creation.
A. Any person who alters regulated wetlands shall restore or create equivalent areas or greater areas of wetlands than those altered in order to compensate for wetland losses.
B. Where feasible, restored or created wetlands shall be a higher category than the altered wetland.
C. Compensation areas shall be determined according to function, acreage, type, location, time factors, ability to be self sustaining and projected success. Wetland functions and values shall be calculated using the best

professional judgement of a qualified wetland ecologist using the best available techniques. Multiple compensation projects may be proposed for one project in order to best achieve the goal of no net loss.

D. Acreage replacement ratio. The following ratios apply to creation or restoration which is in-kind, onsite, timed prior to or concurrent with alteration, and has a high probability of success. These ratios do not apply to remedial actions resulting from illegal alterations. The first number specifies the acreage of wetlands requiring replacement and the second specifies the acreage of wetlands altered.

Category I	6:1
Category II or III	
Forested	3:1
Scrub-shrub	2:1
Emergent	1.5:1
Category IV	1.25:1

i. Increased Replacement Ratio.
The [Approval Authority] may increase the ratios under the following circumstances:
-uncertainty as to the probable success of the proposed restoration or creation;
- significant period of time between destruction and replication of wetland functions;
-projected losses in functional value; or
-offsite compensation.
ii. Decreased Replacement Ratio.
The [Approval Authority] may decrease these ratios under the following circumstance:
-findings of special studies coordinated with agencies with expertise which demonstrate that no net loss of wetland function or value is attained under the decreased ratio.
iii. In all cases, a minimum acreage replacement ratio of 1:1 shall be required.

3) Wetlands Enhancement.

A. Any Applicant proposing to alter wetlands may propose to enhance existing significantly degraded wetlands in order to compensate for wetland losses. Applicants proposing to enhance wetlands shall identify how enhancement conforms to the overall goals and requirements of the local wetlands protection program and established regional goals.

B. A wetlands enhancement compensation project shall be determined pursuant to Sections 7.5.f, provided that enhancement for one function and value will not degrade another function or value and that acreage replacement ratios shall be doubled to recognize existing functional values and, provided further, that category I wetlands shall not be enhanced.

4) Wetland Type

A. In-kind compensation shall be provided except where the applicant can demonstrate that:
i. the wetland system is already significantly degraded and out-of-kind replacement will result in a wetland with greater functional value;
ii. scientific problems such as exotic vegetation and changes in watershed hydrology make implementation of in-kind compensation impossible; or
iii. out-of-kind replacement will best meet identified regional goals (eg., replacement of historically diminished wetland types).
iv. where out-of-kind replacement is accepted, greater acreage replacement ratios may be required to compensate for lost functional values.

5) Location.

A. On-site compensation shall be provided except where the applicant can demonstrate that:
i. the hydrology and ecosystem of the original wetland and those who benefit from the hydrology and ecosystem will not be substantially damaged by the onsite loss; and
ii. onsite compensation is not scientifically feasible due to problems with hydrology, soils, waves, or other factors; or
iii. compensation is not practical due to potentially adverse impact from surrounding land uses; or
iv. existing functional values at the site of the proposed restoration are significantly greater than lost wetland functional values; or
v. that established regional goals for flood storage, flood conveyance, habitat or other wetland functions have been established and strongly justify location of compensatory measures at another site.

B. Offsite compensation shall occur within the same watershed as the wetland loss occurred, provided that category IV wetlands may be replaced outside of the watershed when there is no reasonable alternative.

C. In selecting compensation sites, applicants shall pursue siting in the following order of preference:
i. upland sites which were formerly wetlands;
ii. idled upland sites generally having bare ground or vegetative cover consisting primarily of exotic introduced species, weeds, or emergent vegetation;
iii. other disturbed upland.

6) Timing.

A. Where feasible, compensatory projects shall be completed prior to activities that will disturb wetlands, and immediately after activities that will temporarily disturb wetlands. In all other cases, except for category I wetlands, compensatory projects should be completed prior to use or occupancy of the activity or development which was conditioned upon such compensation. Construction of compensation projects shall be timed to reduce impacts to existing wildlife and flora.

7) Cooperative Restoration, Creation or Enhancement Projects.

A. The [Approval authority] may encourage, facilitate, and approve cooperative projects wherein a single applicant or other organization with demonstrated capability may undertake a compensation project with funding from other applicants under the following circumstances:
   i. restoration, creation or enhancement at a particular site may be scientifically difficult or impossible; or
   ii. creation of one or several larger wetlands may be preferable to many small wetlands.

B. Persons proposing cooperative compensation projects shall:
   i. submit a joint permit application;
   ii. demonstrate compliance with all standards;
   iii. demonstrate the organizational and fiscal capability to act cooperatively; and
   iv. demonstrate that long term management can and will be provided.

g. Mitigation Plans

All wetland restoration, creation and/or enhancement proJects required pursuant to this chapter either as a permit condition or as the result of an enforcement action shall follow a mitigation plan prepared by qualified wetland professionals approved by the [Approval Authority]. The applicant or violator shall receive written approval of the mitigation plan by the Approval Authority prior to commencement of any wetland restoration, creation or enhancement activity. Unless the [Approval Authority], in consultation with qualified wetland professionals, determines, based on the size and nature of the development proposal, the nature of the impacted wetland, and the degree of cumulative impacts on the wetland from other development proposals, that the scope and specific requirements of the mitigation plan may be reduced from what is listed below, the mitigation plan shall contain at least the following components:

1) Baseline Information. A written assessment and accompanying maps of the:
   -impacted wetland including, at a minimum, wetland delineation; existing wetland acreage; vegetative, faunal

and hydrologic characteristics; soil and substrate conditions; topographic elevations and
-compensation site, if different from the impacted wetland site, including at a minimum: existing acreage; vegetative, faunal and hydrologic conditions; relationship within watershed and to existing waterbodies; soil and substrate conditions, topographic elevations; existing and proposed adjacent site conditions; buffers; and ownership.

2) Environmental Goals and Objectives. A written report shall be provided identifying goals and objectives and describing:
-the purposes of the compensation measures including a description of site selection criteria, identification of compensation goals; identification of target evaluation species and resource functions, dates for beginning and completion, and a complete description of the structure and functional relationships sought in the new wetland. The goals and objectives shall be related to the functions and values of the original wetland or if out--of-kind, the type of wetland to be emulated; and
-A review of the available literature and/or experience to date in restoring or creating the type of wetland proposed shall be provided. An analysis of the likelihood of success of the compensation project at duplicating the original wetland shall be provided based on the experiences of comparable projects, if any. An analysis of the likelihood of persistence of the created or restored wetland shall be provided based on such factors as surface and ground water supply and flow patterns, dynamics of the wetland ecosystem; sediment or pollutant influx and/or erosion, periodic flooding and drought, etc., presence of invasive flora or fauna, potential human or animal disturbance, and previous comparable projects, if any.

3) Performance Standards. Specific criteria shall be provided for evaluating whether or not the goals and objectives of the project and for beginning remedial action or contingency measures. Such criteria may include water quality standards, survival rates of planted vegetation, species abundance and , diversity targets, habitat diversity indices, or other ecological, geological or hydrological criteria.

4) Detailed Construction Plans. Written specifications and descriptions of compensation techniques shall be provided including the proposed construction sequence, grading and excavation details, erosion and sediment control features needed for wetland construction and long-term survival, a planting plan specifying plant species, quantities, locations, size, spacing, and density; source of plant materials,

propagules, or seeds; water and nutrient requirements for planting; where appropriate, measures to protect plants from predation; specification of substrate stockpiling techniques and planting instructions; descriptions of water control structures and water-level maintenance practices needed to achieve the necessary hydrocycle/hydroperiod characteristics; etc. These written specifications shall be accompanied by detailed site diagrams, scaled cross-sectional drawings, topographic maps showing slope percentage and final grade elevations, and any other drawings appropriate to show construction techniques or anticipated final outcome. The plan shall provide for elevations which are appropriate for the desired habitat type(s) and which provide sufficient tidal prism and circulation data.

5) Monitoring Program. A program outlining the approach for monitoring construction of the compensation project and for assessing a completed project shall be provided. Monitoring may include, but is not limited to:

A. Establishing vegetation plots to track changes in plant species composition and density over time;
B. using photo stations to evaluate vegetation community response;
C. sampling surface and subsurface waters to determine pollutant loading, and changes from the natural variability of background conditions (pH, nutrients, heavy metals);
D. measuring base flow rates and storm water runoff to model and evaluate water quality predictions, if appropriate;
E. measuring sedimentation rates, if applicable; and
F. sampling fish and wildlife populations to determine habitat utilization, species abundance and diversity.

A protocol shall be included outlining how the monitoring data will be evaluated by agencies that are tracking the progress of the compensation project. A monitoring report shall be submitted annually, at a minimum, documenting milestones, successes, problems, and contingency actions of the compensation project. The compensation project shall be monitored for a period necessary to establish that performance standards have been met, but not for a period less than five years.

6) Contingency Plan. Identification of potential courses of action, and any corrective measures to be taken when monitoring or evaluation indicates project performance standards are not being met.

7) Permit Conditions. Any compensation project prepared pursuant to this section and approved by the [Approval Authority] shall become part of the application for the permit.

8) Performance Bonds and Demonstration of Competence.
A demonstration of financial resources, administrative, supervisory, and technical competence and scientific expertise of sufficient standing to successfully execute the compensation project shall be provided. A compensation project manager shall be named and the qualifications of each team member involved in preparing the mitigation plan and implementing and supervising the project shall be provided, including educational background and areas of expertise, training and experience with comparable projects. In addition, bonds ensuring fulfillment of the compensation project, monitoring program, and any contingency measure shall be posted pursuant to Section 7.5 in the amount of one hundred twenty (120) percent of the expected cost of compensation.

9) Regulatory authorities are encouraged to consult with and solicit comments of any federal, state, regional, or local agency, including tribes, having any special expertise with respect to any environmental impact prior to approving a mitigation proposal which includes wetlands compensation. The compensation project proponents should provide sufficient information on plan design and implementation in order for such agencies to comment on the overall adequacy of the mitigation proposal.

10) Compensatory mitigation is not required for regulated activities:
   A. For which a permit has been obtained that occur only in the buffer or expanded buffer and which have not adverse impacts to regulated wetlands; or
   B. allowed activities pursuant to Section 5.2 provided such activities utilize best management practices to protect the functions and values of regulated wetlands.

7.6 Appeals
Any decision of the [Approval Authority] in the administration of this chapter may be appealed to [hearing body]. The [hearing body] shall give substantial weight to any discretionary decision of the [Approval Authority] rendered pursuant to this Chapter.

7.7 Modification of Wetland Permits
A Wetland Permit holder may request and the [Approval Authority] may approve modification of a previously issued Wetland Permit.

7.8 Resubmittal of Denied Permit Applications
A Wetland Permit application which has been denied may be modified and resubmitted no earlier than one hundred eighty (180) days following action on the original application. A permit application shall be considered a resubmittal if the site proposed for development was the subject of a Wetland Permit application within the previous one hundred eighty (180) days.

Section 8: Temporary Emergency Permit, Enforcement

8.1 Temporary Emergency Permit

Notwithstanding the provisions of this chapter or any other laws to the contrary, the [Approval Authority] may issue a temporary emergency wetlands permit if:

a. The [Approval Authority] determines that an unacceptable threat to life or severe loss of property will occur if an emergency permit is not granted; and

b. The anticipated threat or loss may occur before a permit can be issued or modified under the procedures otherwise required by this act and other applicable laws.

Any emergency permit granted shall incorporate, to the greatest extent practicable and feasible but not inconsistent with the emergency situation, the standards and criteria required for non-emergency activities under this act and shall:

a. be limited in duration to the time required to complete the authorized emergency activity, not to exceed 90 days; and

b. require, within this 90 day period, the restoration of any wetland altered as a result of the emergency activity, except that if more than the 90 days from the issuance of the emergency permit is required to complete restoration, the emergency permit may be extended to complete this restoration.

Issuance of an emergency permit by the [Approval Authority] does not preclude the necessity to obtain necessary approvals from appropriate federal and state authorities.

Notice of the issuance of the emergency permit and request for public comments shall be published at least once a week on the same day of the week for two consecutive weeks in a newspaper having a general circulation in the [local jurisdiction] no later than 10 days after issuance of the emergency permit.

The emergency permit may be terminated at any time without process upon a determination by the [Approval Authority] that the action was not or is no longer necessary to protect human health or the environment.

8.2 Enforcement

The [Approval Authority] shall have authority to enforce this chapter, any rule or regulation adopted, and any permit or order issued pursuant to this chapter, against any violation or threatened violation thereof. The [Approval Authority] is authorized to issue violation notices and administrative orders, levy fines, and/or institute legal actions in court. Recourse to any single remedy shall not preclude recourse to any of the other remedies. Each violation of this chapter, or any rule or regulation adopted, or any permit, permit condition, or order issued pursuant to this chapter, shall be a separate offense, and, in the case of a continuing violation, each day's continuance shall be deemed to be a separate and distinct offense. All costs, fees, and expenses in connection with enforcement actions may be recovered as damages against the violator.

a. Enforcement actions shall include:
   1) Civil Penalties, Administrative Orders and Actions for Damages and Restoration.

   A. The [Approval Authority] may bring appropriate actions at law or equity, including actions for injunctive relief, to ensure that no uses are made of a regulated wetland or their buffers which are inconsistent with this chapter or an applicable wetlands protection program.

   B. The [Approval Authority] may serve upon a person a cease and desist order if an activity being undertaken on regulated wetlands or its buffer is in violation of the act, these rules or a local wetlands protection program. Whenever any person violates this chapter or any permit issued to implement this chapter, the [local unit of government] may issue an order reasonably appropriate to cease such violation and to mitigate any environmental damage resulting therefrom.

   i. Content of order. The order shall set forth and contain:
   -A description of the specific nature, extent, and time of violation and the damage or potential damage; and
   -A notice that the violation or the potential violation cease and desist or, in appropriate cases, the specific corrective action to be taken within a given time. A civil penalty may be issued with the order.
   -Effective date. The cease and desist order issued under this section shall become effective immediately upon receipt by the person to whom the order is directed.
   -Compliance. Failure to comply with the terms of a cease and desist order can result in enforcement actions including, but not limited to, the issuance of a civil penalty.

   C. Any person who undertakes any activity within a regulated wetland or its buffer without first obtaining a permit required by this chapter, except as allowed in Section 5.2, or any person who violates one or more conditions of any permit required by this chapter or of any order issued pursuant to subsection B of this section shall incur a penalty allowed per violation. In the case of a continuing violation, each permit violation and each day of activity without a required permit shall be a separate and distinct violation. The penalty amount shall be set in consideration of the previous history of the violator and the severity of the environmental impact of the violation. The penalty provided in this subsection shall be appealable to the superior court within the subject jurisdiction.

D. Aiding or abetting. Any person who, through an act of commission or omission procures, aids or abets in the violation shall be considered to have committed a violation for the purposes of the penalty.

E. Notice of penalty. Civil penalties imposed under this section shall be imposed by a notice in writing, either by certified mail with return receipt requested or by personal service, to the person incurring the same from the department and/or the [local unit of government], or from both jointly. The notice shall describe the violation, approximate the date(s) of violation, and shall order the acts constituting the violation to cease and desist, or, in appropriate cases, require necessary corrective action within a specific time.

F. Application for remission or mitigation. Any person incurring a penalty may apply in writing within thirty days of receipt of the penalty to the [Approval Authority] for remission or mitigation of such penalty. Upon receipt of the application, the [Approval Authority] may remit or mitigate the penalty only upon a demonstration of extraordinary circumstances, such as the presence of information or factors not considered in setting the original penalty.

G. Orders and penalties issued pursuant to this subsection may be appealed as provided for by in Section 7.6.

H. Criminal penalties shall be imposed on any person who wilfully or negligently violates this chapter or who knowingly makes a false statement, representation, or certification in any application, record or other document filed or required to be maintained under this chapter or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device, record or methodology required to be maintained pursuant to this chapter or pursuant to a Wetland Permit.

Section 9: Non-Conforming Activities

A regulated activity that was approved prior to the passage of this chapter and to which significant economic resources have been committed pursuant to such approval but which is not in conformity with the provisions of this chapter may be continued subject to the following:

a. No such activity shall be expanded, changed, enlarged or altered in any way that increases the extent of its non-conformity without a permit issued pursuant to the provisions of this chapter;

b. Except for cases of discontinuance as part of normal agricultural practices, if a non-conforming activity is discontinued for 12 consecutive months, any resumption of the activity shall conform to this chapter;

c. If a non-conforming use or activity is destroyed by human activities or an act of God, it shall not be resumed except in conformity with the provisions of this chapter;

d. Activities or adjuncts thereof that are or become nuisances shall not be entitled to continue as non-conforming activities.

Section 10: Judicial review

Any decision or order issued by the [Approval Authority] pursuant to this chapter, including decisions concerning denial, approval, or conditional approval of a Wetland Permit, may be judicially reviewed in the [Circuit Court), provided that:

a. available administrative remedies, including appeals available pursuant to Section 7.6, have been exhausted; and

b. such review is commenced by the filing with the court and the [Approval Authority] of a legal action within thirty (30) working days after service of such order or issuance of notice of such decision, as the case may be.

Based on these proceedings and the decision of the court, the [Approval Authority] may, within the time specified by the court, elect to:

a. Institute negotiated purchase or condemnation proceedings to acquire an easement or fee interest in the applicant's land;

b. Approve the permit application with lesser restrictions or conditions; or

c. other appropriate actions ordered by the court that fall within the jurisdiction of the [Approval Authority].

Section 11: Amendments

These regulations and the [Name of Local Government Map] may from time to time be amended in accordance with the procedures and requirements in the general statutes and as new information concerning wetland Location, soils, hydrology, flooding, or wetland plants and wildlife become available.

Section 12: Severability

If any clause, sentence, paragraph, section or part of this chapter or the application thereof to any person or circumstances shall be adjudged by any court of competent Jurisdiction to be invalid, such order or judgement shall be confined in its operation to the controversy in which it was rendered and shall not affect or invalidate the remainder of any part thereof to any other person or circumstances and to this end the provisions of each clause, sentence, paragraph, section or part of this law are hereby declared to be severable.

Section 13: Assessment Relief

The Assessors [of Local Government] shall consider wetland regulations in determining the fair market value of land. Any owner of an undeveloped wetland who has dedicated an easement or entered into a perpetual conservation restriction with the [local unit of government] or a nonprofit organization to permanently control some or all regulated activities in the wetland shall have that portion of land assessed consistent with those restrictions. Such landowner shall also be exempted from special assessments on the controlled wetland to defray the cost of municipal improvements such as sanitary sewers, storm sewers,
and water mains.

Section 14 Non-regulatory Incentive Program. Reserved

Section 15: Codification

Section 16: Effective Date

1889

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

October 24, 1990

Washington State City and County Planning Directors

RE: Ecology's Model Ordinance for Wetland Protection

The purpose of this letter is to clarify the intent and purpose of Ecology's model ordinance for wetland protection that was distributed earlier this month.

The model ordinance, which we developed pursuant to Governor Gardner's Executive Order 90-04, is a voluntary technical assistance recommendation. The standards and policies contained within the ordinance represent a careful compilation of the best sections of existing local ordinances that protect wetlands and the expertise of Ecology staff and others. We believe that the model is a tool that local government may elect to use in order to achieve no net loss of wetlands within their jurisdiction. The Department of Ecology has no authority to require that local government adopt the model ordinance or any of its policies and standards.

Most of you are aware that Ecology has established a Wetland Protection Grant Program and many of you have requested grant funds in order to implement wetland protection regulations. We fully anticipate that local governments choosing to adopt this ordinance under the grant program will choose to modify the document as a result of public comment and the need to tailor it to fit the particular characteristics of each community. We do anticipate that these grant-funded local programs will generally reflect the intent of Ecology's model ordinance to achieve a goal of no net loss of wetland functions and values.

Finally, this ordinance is not a static document. We expect to revise the model ordinance to incorporate the knowledge gained by local governments as you implement wetland protection programs during this grant process and new technical information regarding wetlands as it becomes available.

Please call me at (206) 459-6777 or SCAN 585-6777 or Wendy Eliot of my staff at (206) 493-2681 or SCAN 585-2681 if you have any questions regarding this letter or the model ordinance.

Sincerely,

D. Rodney Mack, Manager
Shorelands and Coastal Zone
Management Program

DRM:la

cc: Wendy Eliot

ATTACHMENT N-6

Washington State Wetlands Rating System

WASHINGTON STATE WETLANDS RATING SYSTEM

for

RATING THE RESOURCE VALUE OF REGULATED WETLANDS

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BACKGROUND

On October 1st, 1990 the Department of Ecology issued a non-mandatory Model Ordinance for Wetlands Protection to all Washington State local governments. The Model Ordinance contained two options for rating wetlands; local governments could use either the Washington State Four-Tier Wetlands Rating System, or the Puget Sound Region Wetlands Rating System

This evaluation is a planned review of the recommended wetlands rating system based on comments we have received and our own knowledge of the need to improve the methodology. The main thrust is to introduce rating criteria that are more specific and less qualitative. We are also merging the two rating systems into one statewide system that accounts for regional differences.

Following the evaluation and field testing, guidance for users will be finalised and changes to the rating system will be formally recommended to local government. This system will also be used by Ecology and may be used by other state agencies in conjunction with existing regulatory programs as appropriate.

INTRODUCTION

The remaining wetlands in Washington state differ widely in resource value. Some wetland types are common, and others are rare, but all provide some valued functions. These may be ecologic, economic, recreation or aesthetic. To effectively protect the remaining wetlands, managers, planners and citizens need to be able to better understand the resource value of individual wetlands. One way to accomplish this is with a wetlands rating system: a process that differentiates wetlands according to specific characteristics or functional attributes. Permit decisions are considered in light of the wetland rating and the potential development impact. Regulatory stringency and protective measures are varied, with the highest levels of protection given to the highest rated wetlands.

Amongst wetlands scientists, planners and regulators there is debate on the merits of rating wetlands at all. There is also debate on the use of case-by-case versus landscape approaches to wetlands management. Advocates of wetland rating note that this management approach avoids the multitude of case-by-case, subjective impact determinations made by permit administrators. Wetland rating systems also afford potential developers with early notice of wetland sensitivity according to the rating assigned to a wetland. A rating system will increase predictability, certainty and consistency of decision making. Additionally, it may simplify and expedite permit review. Wetland rating can increases the credibility of a wetland protection program by relating protection standards to wetland value.

Critics of wetland rating are concerned that it can be used as a mechanism to direct development impacts to lower rated wetlands, serving only to protect higher rated wetlands. Other critics point to possibly subjective interpretations that may be required on behalf of the wetland evaluator in order to determine a wetland's category or rating, and the high amount of training which may be necessary to ensure appropriate determinations. Additionally, rating systems differentiate and place value on wetland characteristics that are only partially understood. Not only do we lack information on the complex internal processes of individual wetlands, but the interaction of the processes of multiple systems is not fully understood nor are the effects of their cumulative loss. Compounding the problem, less published scientific data exist concerning Northwest wetlands than those in the East and Midwest.

Despite the potential drawbacks, the Department of Ecology has developed a rating system to be used in the State of Washington. The Department of Ecology's rating system uses a combination of a landscape approach and case-by-case analysis to determine wetlands value. Ecology's rating system uses specific criteria to allow a determination of the resource value of individual wetlands within four possible categories. The rating value is based on wetland sensitivity to disturbance, rarity, irreplaceability, existing vegetation and habitat value. The management [illegible] according to this system include the width of buffers necessary to protect wetlands from adjacent development, mitigation acreage and replacement ratios and permitted uses in wetlands. This system does not replace a full functional assessment of a wetland which will be necessary in order to plan and monitor a wetland mitigation project The system identifies a relative value for vegetated wetlands and is intended primarily for use with the Clean Water Act definition of wetlands. It does not include mudflats, strreambeds, beach substrates and other ecologically valuable wetlands.

It is not considered perfect nor the final answer, however, it is based on the best information available at this time. Advances in wetlands science will bring further understanding to the valuation of wetlands. It is anticipated that the rating system will be further modified over time as we increase our understanding of wetland systems and improve on our ability to measure wetland functions and values.

An essential question is whether or not the rating system will help to protect the public resource value of wetlands. The system is designed to assist local or state government agencies with legal jurisdiction for wetlands. As a tool for protection it's success will depend on how it is used. Nevertheless, the Department of Ecology is confident the system will be used in good faith by agencies with responsibility to protect the public resource.

In fine-tuning the system, the Department of Ecology is aware that many local governments are either using, or in the process of developing and adopting systems for determining the value of individual wetlands. The Department's intention in completing this evaluation is to maintain existing distinctions between the four wetland categories, while adding refinement and predictability.

OVERVIEW FOR USERS

HOW THE WETLANDS RATING SYSTEM WORKS

The system requires that specific criteria (or sub-criteria) be confirmed either from state agency sources or the application of the field methodology before a particular wetland is assigned to a category.

A summary of the sources of data and criteria to rate individual wetlands according to category are shown in Table 1 on p.5. Details of the sub-criteria, sources of data and justification for each of the criteria are given beginning on p.13.

The wetlands rating form on p.9 is a step by step method for determining category based on criteria and subcriteria. It has two parts, the first for rating wetlands according to information from State Government agencies and the secondpart, beginning on p.10, for rating wetlands according to infomation from the field data form in the companion document Washington State Wetlands rating System-Field methodology. When using the wetlands rating form, confirmation of criteria (or subcriteria) automatically assigns the wetland to a category.

WHEN TO USE THE WETLANDS RATING SYSTEM

The system is designed to determine wetlands categories for users of the Department of Ecology's Model Ordinance for Wetlands Protection and for agencies developing agency procedures for wetlands protection and for local regulatory programs being developed or revised.

This rating system was developed to be used with the management standards on p.7, (or similar standards). The use of lesser protective measures with this rating system may result in inadequate protection of wetlands functions and values.

It is important to understand that regional differences may need to be accounted for in addition to these standards. This system was designed for use on a state wide basis and may not reflect ragional differences accurately. It may therefore be necessary to modify the criteria, or sub-criteria.

It may also be necessary to modify the system to account for local circumstances. See p.32 for recommendations on how to address this.

TABLE 1: SUMMARY OF CRITERIA BY CATEGORY AND DATA SOURCES

CRITERIA FOR EACH CATEGORY	DATA SOURCES
CATEGORY I WETLANDS ARE -	
(i) Documented habitat recognized by federal or state agencies for threatened or endangered species of	
plant or potentially extirpated plant, ...	DNR (Natural Heritage)
animal, ...	W D Wildlife
or fishspecies; or	W D Wildlife & W D Fisheries
(ii) Documented Natural Heritage wetland sites or high quality native wetland communities which qualify as a Natural Heritage wetland sites; **or**	DNR (Natural Heritage) **or** Field Methodology
(iii) Documented habitat of regional (Pacific Coast) or national significance for migratory birds; **or**	W D Wildlife
(iv) Regionally rare wetlands communities; **or**	Field Methodology
(v) Wetlands with irreplaceable ecological functions.	Field Methodology
CATEGORY II WETLANDS SATISFY NO CATEGORY I CRITERIA, AND ARE-	
(i) Documented habitat recognized by federal or state agencies for sensitive species of plant, ...	DNR (Natural Herit
animal, ...	W D Wildlife
or fish species; **or**.	W D Wildlife & W D Fisheries
(ii) Documented priority habitats and species recognized by state agencies; **or**	W D Wildlife
(iii) Wetlands with significant functions which may not be adequately replicated through creation or restoration; **or**	Field Methodology
(iv) Wetlands with significant habitat value.	Field Methodology
CATEGORY III WETLANDS SATISFY NO CATEGORY I, II OR IV CRITERIA.	Field Methodology
CATEGORY IV WETLANDS SATISFY NO CATEGORY I, II OR III CRITERIA, AND ARE-	
a) hydrologically isolated, < 1acre, with one vegetated class and dominated (>80%) by one native species from Table 7, (p.31);	Field Methodology
or b) hydrologically isolated, < two acres, with one vegetated class, and 90% of plant cover composed of species from Table 8 ,(p.31).	Field Methodology

SUMMARY OF THE RATIONALE FOR THE CATEGORIES

The following description of the different categories should help to characterize the approach we have taken in defining and protecting the wetlands under this system.

CATEGORY I

These wetlands are the "cream of the crop". Generally, these wetlands are going to [illegible] rarely in a given area and should make up less than 5% of the wetlands in the state. These are the types of wetlands that: 1) are very valuable for a particular rare species; 2) represent a high quality example of a rare wetland type; 3) are rare within a given region; 4) provide irreplaceable functions and values; or 5) are impossible to replace within a human lifetime if at all. These are the types of wetlands to which we cannot afford to risk any kind of degradation.

CATEGORY II

These wetlands are those that: 1) provide habitat for very sensitive or important wildlife or plants; 2) are either difficult to replace; or 3) provide very high functions and values, particularly wildlife habitat. These wetlands will occur more commonly than Category I wetlands and need a high level of protection.

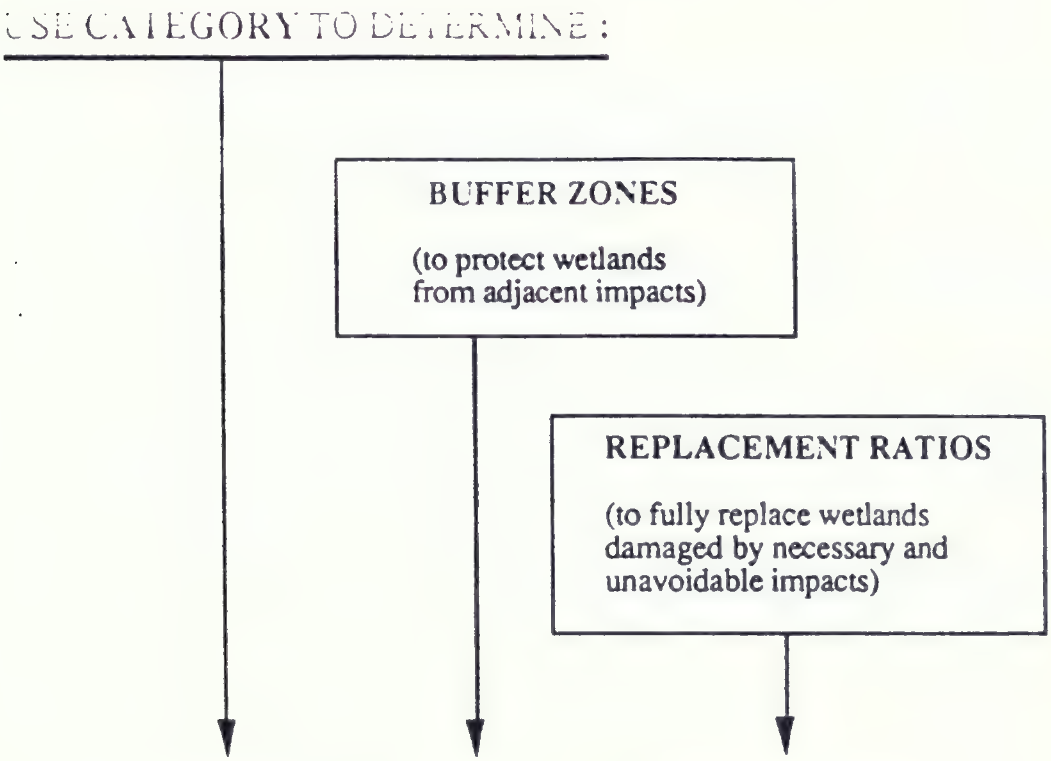
CATEGORY III

These wetlands provide important functions and values. They are important for a variety of wildlife species and occur more commonly throughout the state. They will occur most frequently, generally be difficult to replace, and need a moderate level of protection.

CATEGORY IV

These wetlands are those that are smaller, isolated and less diverse vegetatively. They are the types of wetlands that we should be able to replace and may even be able to improve on from a habitat standpoint. However, replacement is by no means guaranteed. These wetlands do provide important functions and values, and losses must be mitigated for. In some areas, (for example, islands), these wetlands may be providing important groundwater recharge functions and may require higher protection. Thus, regional differences may call for a more narrow definition of this category.

FIGURE 1. DRAFT MANAGEMENT STANDARDS FOR BUFFER ZONE REQUIREMENTS AND REPLACEMENT RATIOS BY WETLAND CATEGORIES. (These buffer requirements and replacement ratios are currently subject to review)


USE CATEGORY TO DETERMINE :
BUFFER ZONES
(to protect wetlands from adjacent impacts)
REPLACEMENT RATIOS
(to fully replace wetlands damaged by necessary and unavoidable impacts)

CATEGORY	BUFFER ZONES (ft.)	REPLACEMENT RATIOS
I	*200 - 300*	*6 : 1*
II	*100 - 200*	*FORESTED 3 : 1* *SCRUB-SHRUB 2 : 1* *EMERGENT 1.5 : 1*
III	*50 - 100*	
IV	*25 - 50*	*1.25 : 1*

HOW TO USE THE WETLAND RATING SYSTEM

INSTRUCTIONS

STEP 1. OBTAIN COPY OF MAPS SHOWING DELINEATED BOUNDARIES, OR DECIDE THAT DELINEATION IS NOT NECESSARY FOR YOUR PURPOSES*

STEP 2. SEND LETTERS TO STATE AGENCIES REQUESTING INFORMATION (SEE SAMPLE LETTERS ON p.37) AND ATTACHING A COPY OF A MAP SHOWING THE WETLAND LOCATION.

STEP 3. WAIT FOR STATE AGENCIES TO RETURN INFORMATION, THEN COMPLETE THE "OFFICE DATA" SECTION OF THE **WETLAND RATING FORM** (SEE p.9).

STEP 4. IF NECESSARY, GO TO THE WETLAND AND COMPLETE THE **FIELD DATA FORM** IN THE WASHINGTON WETLANDS RATING SYSTEM - FIELD METHODOLOGY.

STEP 5. COMPLETE THE "FIELD DATA" SECTION OF THE **WETLAND RATING FORM** TO DETERMINE CATEGORY (SEE p.10).

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* For regulatory purposes it is assumed that wetland locations are accurately known before categories are determined. The area of land affected by buffers for example, depends firstly on the location of a given wetland and secondly the category of the wetland. Delineation using the Federal Manual should proceed determination of category.

This does not mean that delineation of wetlands must always be determined according to the (relatively expensive and time consuming) Federal Manual before a meaningful determination of category can be made.

For example, determination of category on the basis of a "less than strict" delineation may be useful in a local government overview for inventory or policy purposes, or to meet the needs of individuals who need a "best estimate" of wetland value for project analysis. National Wetlands Inventory maps could be used for this purpose.

WETLANDS RATING FORM (Office data)		
ANSWER ALL QUESTIONS BELOW (If the agency identifies the wetland as satisfying any of the questions below, the wetland is automatically assigned to the category shown in the "CATEGORY" column. If more than one category is circled the highest applies.)	SOURCE	CATEGORY Circle categories that apply
Does the wetland contain individuals of Federal or State-listed Threatened or Endangered plant species; or is the wetland an historic location of a plant species thought to be possibly Extinct or Extirpated from Washington?	DNR (Natural Heritage)	Yes : Category I No: Next Question
Does the wetland contain documented priority habitats for State-listed or candidate Threatened or Endangered wildlife species managed by the Washington Department of Wildlife?	W D Wildlife	Yes : Category I No: Next Question
Does the wetland contain documented habitats of State or Federally listed or State or Federal candidate Threatened or Endangered fish species, or races of fish, managed by the Washington Department of Wildlife or the Washington Department of Fisheries?	W D Wildlife & W D Fisheries	Yes : Category I No:Next Question
Is the wetland already on record with the Washington Natural Heritage Program as a high quality native wetland?	DNR (Natural Heritage)	Yes: Category I No: Next Question
Is the wetland documented as habitat of regional (Pacific Coast) or national significance for migratory birds?	W D Wildlife	Yes: Category I No:
Does the wetland contain individuals of State-listed Sensitive plant species?	DNR (Natural Heritage)	Yes: Category II No: Next Question
Does the wetland contain documented habitat for State-listed or candidate sensitive wildlife species managed by the Washington Department of Wildlife?	W D Wildlife	Yes: Category II No: Next Question
Does the wetland contain documented habitats of State or Federally listed or candidate Sensitive fish species managed by the Washington Department of Wildlife or the Washington Department of Fisheries?	W D Wildlife & W D Fisheries	Yes: Category II No: Next Question
Does the wetland contain priority species or habitats documented by Washington Department of Wildlife's Priority Habitats and Species Program.	W D Wildlife	Yes : Category II No: Field Methodology

WETLANDS RATING FORM (Field data)

Use information from field data form to answer these questions Work through questions sequentially. Circle answers.	CATEGORY Circle any Category or answer that applies
Q. 1. Is the wetland a high quality native wetland community which would qualify as a Natural Heritage wetland based on satisfying all of a-e below or, is the wetland is one of the five highest quality examples of this wetland type known to exist in Washington? a) there is no, or only isolated, human-caused alteration of the wetland topography or soils; b) there is no human-caused alteration of the hydrology of the wetland, or the wetland appears to have recovered from the alteration; c) the wetland has no or low cover and frequency of non-native plant species; d) there is relatively little human-caused disturbance of the native vegetation, or has the vegetation recovered from past; disturbance; e) there is no evidence of major human-caused water quality problems.	Yes: Category I No: go to Q. 2.
Q. 2. Is the wetland one of only five or less examples of the wetland type, as represented by plant-association, within the Water Resources Inventory Area of which the wetland is a part?	Yes: Category I No: go to Q. 3.
Q. 3. Is the wetland a peat wetland?	Yes: go to Q. 3a.
Is the Wetland a forested wetland?	Yes: go to Q. 3b.
Is the wetland an estuarine wetland?	Yes: go to Q. 3c.
Are kelp or eelgrass beds present?	Yes: go to Q. 3d. If No to all go to Q. 4.
Q. 3a. Is the wetland a peat wetland without significant hydrologic modification where significant hydrologic modification is demonstrated by any of the following five sub-criteria: -Replacement of pre-settlement flora (if determined) by monotypic Spiraea (hardhack), reed canary grass or cattail; or -More than 70% of flora replaced by species in above; or -Evidence of drainage ditches, peat stockpiling, peat dredging or mining, removal of woody vegetation, plowing or planting i.e. corn ; or (see next page)	Yes: Category I No: Category II

Q.3a. (continued) -Diversion of water source wherethe peat is dry and decomposing, often white and dry on surface clearly oxidizing and disintegrating; or -Severe grazing, with evidence of heavy trampling, vegetation removal and nutrient addition.	
Q. 3b. Isthe forested wetland a mature forested wetland satisfying all of the following four subcriteria? - Forested wetland where at least 50% of the tree canopy coverage is mature trees, 80 yrs or older for softwoods and 50 yrs or older for hardwoods; and - Prescence or seedlings or saplings of one or more of the dominant overstory tree species; and - Non-native species constitute less than 50% of herbaceous coverage; and - Area greater than 1 acre.	Yes: Category I No: Category II or III (see Q. 5.)
Q. 3c. Does the Estuarine Wetland satisfy any of the following three sub-criteria? - Listed as a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve or any preserve or reserve designated under WAC 332-30-151; or - Greater than five acres; or - Less than five acres and satisfying any four of the following: - greater than 1 acre; or - contains at least two estuarine wetland habitat classes (Dethier, 1990); or - minimum existing evidence of human related physical alteration (e.g., diking, ditching, filling, cultivating, grazing or introduced species);or - contains functional tidal channel(s) or is connected to a tidal stream; or - within 1/4 mile of other water bodies (e.g., lakes or wetlands greater than one acre in size or streams or sloughs greater than 5 cubic feet/second mean annual flow); or - within a watershed that has little to moderate point or non- point water quality problems cited by the Department of Ecology; or - adjacent land uses on more than 75 percent of the wetland border consist of either agriculture, relatively undisturbed forest, or open space or, if there are current or planned Industrial, Commercial, or Residential adjacent uses there is/will be a high quality buffer at least 100' wide.	Yes: Category I No: Category II

Q. 3d.	
Is an Eel grass bed present?	Yes : Category I
Is floating or non-floating kelp bed present which has greater than 50% macro algal cover in the month of August or September ?	Yes : Category I No Category II
Q 4. Is the wetland a wetland with significant functions which may not be adequately replicated through creation or restoration as below?	
Any peat wetland that has significant hydrologic modification as in Q. 3a.	Yes: Category II No: Go to Q. 5.
Any forested wetland not satisfying Q. 3b. and scoring more than 10 points for Q. 5.	Yes: Category II No: Category III
Any estuarine wetlands not satisfying Q. 3c.	Yes : Category II
Any kelp bed not satisfying Q. 3d.	Yes: Category II
Q. 5. Does the wetland have significant habitat value based on a habitat value score greater or equal to 10 points (see field methodology)?	Yes : Category II No : Category III
Q. 6. a) Is the wetland hydrologically isolated, < 1acre, with one vegetated class and dominated (>80%) by one native species from Table 7, (p. 31);	YES: Category IV No: Category I, II or III
or b) Is the wetland hydrologically isolated, < two acres, with one vegetated class, and 90% of plant cover composed of species from Table 8 ,(p. 31).	Yes: Category IV No: Category I, II or III

SUBCRITERIA, SOURCES AND JUSTIFICATION FOR EACH CRITERIA

CRITERIA: CATEGORY I (i) - Documented habitat recognized by federal or state agencies for threatened or endangered species of plant or possibly extinct or extirpated plant, animal, or fish.

SUB-CRITERIA - PLANT SPECIES

Does the wetland contain individuals of Federal or State-listed Threatened or Endangered plant species; or is the wetland an historic location of a plant species thought to be possibly Extinct or Extirpated from Washington?

SOURCE OF INFORMATION

Contact the Washington Natural Heritage Program by mail to determine if any plant species of concern have been located in or near the study area. A sample letter is included in Figure 2. Send a general map of the study area along with township/range/section information. A fee is charged for a search of the Natural Heritage Program database.

Washington Natural Heritage Program
Department of Natural Resources
Division of Land and Water Conservation
Mail Stop: EX-13
Olympia, Washington 98504
206-753-2449

The Washington Natural Heritage Program maintains a comprehensive database of site-specific information on reported occurrences of Sensitive, Threatened, Endangered and known historic occurrences of Possibly Extinct or Extirpated plant species in Washington. At the time of writing most wetlands in Washington have not been surveyed for the occurrence of State Sensitive, Threatened, Endangered and Possibly Extinct or Extirpated plant species.

NOTE: Unidentified plant species collected during site visits should be identified only by qualified botanists familiar with the Pacific Northwest flora. If the study site is an historic collection site for a Possibly Extinct or Extirpated plant species or is within 1/2 mile of such a site, then a rare plant survey by a qualified botanist familiar with the Pacific Northwest flora should be conducted to determine the presence of the species of concern.

JUSTIFICATION

Some species of Threatened or Endangered plants are found exclusively or predominantly in wetland habitats. Examples include Wenatchee larkspur *Delphinium viridescens* in the Leavenworth/Wenatchee area, and howellia *Howellia aquatilis* in Clark and Spokane Counties.Table 2 lists State-listed Threatened and Endangered species that may be found in wetlands.

Some species of Possibly Extinct or Extirpated plant species are (were) found exclusively or predominantly in wetland habitats. Examples include swamp sandwort *Arenaria paludicola* west of the Cascades, and purple spike-rush *Eleocharis atropurpurea* in Chelan County. Table 3 lists State-listed species thought to be Possibly Extinct or Extirpated from Washington and that may be found in wetlands.

TABLE 2. State-listed Threatened and Endangered plant species that may be found in wetlands. (From Washington Natural Heritage Program, 1990)

THREATENED SPECIES

Calamagrostis crassiglumis (thick-glume reedgrass)

Corydalis aquae-gelidae (Clackamas corydalis)

Lobelia kalmii (Kalm's lobelia)

Platanthera chorisiana (Choriso bog orchid)

Sisyrinchium sarmentosum (pale blue-eyed grass)

ENDANGERED SPECIES

Cypripedium calceolus var. parviflorum (yellow lady's slipper)

Delphinium viridescens (Wenatchee larkspur)

Howellia aquatilis (howellia)

Liparis loeselii (twayblade)

Polemonium pectinatum (Washington polemonium)

Rorippa columbiae (persistentsepal yellowcress)

Table 3. State-listed Possibly Extinct or Extirpated plant species that may be found in wetlands. (From Washington Natural Heritage Program, 1990).

Arenaria paludicola (swamp sandwort)

Eleocharis atropurpurea (purple spike-rush)

Juncus hemiendytus var. hemiendytus (dwarf rush)

Nymphaea tetragona (pygmy water-lily)

Sidalcea malviflora var. virgata (rose checker-mallow)

SUB-CRITERIA - ANIMAL SPECIES

Does the wetland contain documented priority habitats for State-listed or candidate Threatened or Endangered wildlife species managed by the Washington Department of Wildlife?

SOURCE OF INFORMATION

Contact the Department of Wildlife by mail to determine if priority habitat for any state listed or candidate species has been documented in or near the wetland being studied. A sample letter is included in Figure 3. Send a general map showing the location of the wetlands along with township/range/section information.

Washington Department of Wildlife
Nongame Program
c\o Mail Stop EX-12
Olympia, Washington 98504
(206) 586-1449

The Department of Wildlife maintains a database of the locations of priority habitat for all wildlife designated as priority species in Washington. The database includes documented breeding sites, colonial or communal roosts, areas of regular concentration and/or locations of individual observations. This information is mapped onto a geographic information system. All federally listed or proposed Threatened and Endangered wildlife species occurring in Washington also have State-listed status. There is relatively complete information on priority habitats for state listed or candidate Endangered or Threatened wildlife.

JUSTIFICATION

There are few listed or candidate State Endangered or Threatened species that are confined to wetland habitats in forested areas. One of the few examples is the western pond turtle *Clemmys marmorata*, a State-listed Threatened species. However, the peregrin falcon *Falco peregrinus* and Columbia white-tailed deer *Odocoileus virginianus leucurus*, both State Endangered species, use wetlands as well as other habitats in forested areas.

SUB-CRITERIA - FISH SPECIES

Does the wetland contain documented habitats of State or Federally listed or State or Federal candidate Threatened or Endangered fish species, or races of fish, managed by the Washington Department of Wildlife or the Washington Department of Fisheries?

SOURCE OF INFORMATION

Washington Department of Wildlife
Nongame Program
c\o Mail Stop EX-12
Olympia, Washington 98504
(206) 586-1449

and

Washington Department of Fisheries
115 General Administration Building
Olympia, Washington 98507
206-753-6650

Presence of these species is indicated by identifying those river drainages in which these species are found. Distribution tables or maps can serve as a primary method for determining if wetlands are potentially used by listed or candidate Threatened or Endangered species. Additional information can be sought from the Washington River Information System (WARIS), a PC-based and GIS-based database which provides information on anadromous fish habitat, resident fish habitat, rare habitat, and habitat used by species of concern. This database currently includes habitat information for over 2,000 river and stream reaches in the State of Washington. It is being upgraded to include over 60,000 reaches. Information from this database can be acquired from the Washington Department of Wildlife (GIS Section) in Olympia, and may be available in the future at district offices, universities and colleges, and selected libraries.

Most stream/river reaches in the State have not been surveyed for listed or candidate Threatened or Endangered fish species. The statewide distribution of bull trout is currently under investigation.

The Washington Department of Wildlife and Washington Department of Fisheries should be consulted as to future listings of species or races of fish as Threatened or Endangered.

JUSTIFICATION

These are wetlands that contain individuals, populations, or priority habitat of State or Federally listed or State or Federal candidate Threatened or Endangered fish species, or races of fish, managed by the Washington Department of Wildlife or the Washington Department of Fisheries. At the time of publication, no fish species or races of fish species within the State of Washington are listed by the State or Federal government as Threatened or Endangered species. The Olympic mudminnow and bull trout are classified as Federal candidate Threatened species. No fish species or races are currently listed as State candidate Threatened or Endangered.

Only one candidate fish species, the Olympic mudminnow, is likely to be dependent upon wetland habitat. This fish occurs in coastal lowlands of the western Olympic Peninsula. It is found in the Queets River south to Grays Harbor, and along the north side of the Chehalis River valley to the Skookumchuck River. Within this range of distribution, the Olympic mudminnow is abundant in marshes and marshy streams. They are generally found in quiet waters with mud substrate and dense aquatic or riparian vegetation. Bull Trout are found in higher Cascade Mountain drainages in clean, cold water.

CRITERIA : CATEGORY I (ii) - Documented high quality Natural Heritage wetland sites or high quality native wetland communities which qualify as a Natural Heritage wetland sites.

SUB-CRITERIA

1) the wetland is already on record with the Washington Natural Heritage Program as a high quality native wetland; or

2) the wetland contains an example of a native wetland community that satisfies all the criteria for a high quality wetland, which are listed below; or

a) there is no, or only isolated, human-caused alteration of the wetland topography or soils;

b) there is no human-caused alteration of the hydrology of the wetland, or does the wetland appear to have recovered from the alteration;

c) the wetland has no or low cover and frequency of non-native plant species;

d) there is relatively little human-caused disturbance of the native vegetation, or the vegetation has recovered from past; disturbance;

e) there is no evidence of major human-caused water quality problems.

3) the wetland is one of the five highest quality examples of this wetland type known to exist in Washington.

SOURCE OF INFORMATION

1) Contact the Washington Natural Heritage Program by mail to determine if a Natural Heritage wetland has been identified in or in the vicinity of the project. A sample letter is provided in Figure 2. The Washington Natural Heritage Program maintains a data system on high quality wetland systems. The data set is not complete but is well developed for the lowlands west of the Cascade Mountains.

Washington Natural Heritage Program
Department of Natural Resources
Division of Land and Water Conservation
Mail Stop: EX-13
Olympia, Washington 98504
206-753-2449

and/or

2) site examination (see field methodology)

JUSTIFICATION

Despite the abundance of certain types of wetlands, extremely high quality, undisturbed examples of those wetlands are rare. This subcriteria attempts to identify and to afford a high level of protection to the undisturbed character of the extremely high quality wetlands remaining in the State.

CRITERIA: CATEGORY I (iii) -Documented habitat of regional (Pacific Coast) or national significance for migratory birds

SUB-CRITERIA

Is the wetland documented habitat of regional (Pacific Coast) or national significance for migratory birds?

SOURCE

Contact the Department of Wildlife by mail to determine if the wetland is documented habitat of regional (Pacific Coast) or national significance for migratory birds. A sample letter is included in Figure 3. Send a general map showing the location of the wetlands along with township/range/section information.

Washington Department of Wildlife
Nongame Program
c\o Mail Stop EX-12
Olympia, Washington 98504
(206) 586-1449

JUSTIFICATION

Some wetland areas are of particular importance in the life cycles of migratory birds. The birds use them as breeding sites, as resting or feeding sites along migratory routes or as sites for shelter during storms. Because of the recognized national importance of migratory birds and international obligations it is important to afford these areas high levels of protection.

CRITERIA : CATEGORY I (iv) - Regionally rare native wetland types.

SUB-CRITERIA

Is the wetland one of only five or less examples of the wetland type, as represented by plant-association, within the Water Resources Inventory Area of which the wetland is a part?

SOURCE OF INFORMATION

See field methodology, and Table 4 for possible regionally rare native wetland types Water Resource Inventory Areas have been mapped and copies of the maps are enclosed with this document. A list names and numbers of the Water Resource Inventory Areas is given in Table 5

Table 4. Possible Regionally Rare NativeWetland Types as represented by Plant Association

Wetland Types	Plant Associations
FORESTED	
Brackish swamp	
Freshwater swamp	old> 60yr *Thuja plicata/Tsuga heteropylla* old> 50yr *Fraxinus latifolia* forest [illegible]
NONFORESTED VEGETATED	
kelp community	
other algae i.e submerged algae	
seagrass beds	*Zostera marina*
salt marsh	*Carex lyngbyii, Salicornia virginica, Scirpus validus, Triglochin maritimum*
salt meadow	
brackish marsh	similar associations to salt marsh
coastal freshwater marsh	*Alnus incarna, Ledum groenlandicum*
scrub/shrub	*Salix pedicillatus,Ledum groenlandicum, Carex deweyenna, Ribes bracteosum, Symphoricarpus albus*
inland freshwater marsh	
bog/fen	*Ledum groenlandicum/Kalmia occidentalis/*sphagnum
vernal ponds	
RIPARIAN	
moss/lichen	
herbaceous	
Scrub/Shrub	
Forested	

NOTE: PLEASE LET US KNOW OF REGIONALLY RARE TYPES, WE NEED TO ADD MORE EXAMPLES, BY REGION IF POSSIBLE, TO THIS TABLE.

JUSTIFICATION

While other criteria provide for protection of individual parts of wetlands, the criteria for regionally rare wetland types is designed to protect a high diversity of wetland plant associations, and the range of these associations. For the purposes of this criteria a region is defined as a Water Resources Inventory area. This definition may need refinement as the inventory areas may not be small enough. If this is the case smaller areas will be defined.

Table 5. Water Resources Inventory Area Names and Numbers

01. Nooksack	32. Walla Walla
02. San Juan	33. Lower Snake
03. Lower Skagit-Samish	34. Palouse
04. Upper Skagit	35. Middle Snake
05. Stillaguamish	36. Esquatzel Coulee
06. Island	37. Lower Yakima
07. Snohomish	38. Naches
08. Cedar-Sammamish	39. Upper Yakima
09. Duwamish-Green	40. Alkali-Squilchuck
10. Puyallup-White	41. Lower Crab
11. Nisqually	42. Grand Coulee
12. Chambers-Clover	43. Upper Crab-Wilson
13. Deschutes	44. Moses Coulee
14. Kennedy-Goldsborough	45. Wenatchee
15. Kitsap	46. Entiat
16. Skokomish-Dosewallips	47. Chelan
17. Quilcene-Snow	48. Methow
18. Elwha-Dungeness	49. Okanogan
19. Lyre-Hoko	50. Foster
20. Soleduck-Hoh	51. Nespelem
21. Queets-Quinault	52. Sanpoil
22. Lower Chehalis	53. Lower Lake Roosevelt
23. Upper Chehalis	54. Lower Spokane
24. Willapa	55. Little Spokane
25. Grays-Elochoman	56. Hangman
26. Cowlitz	57. Middle Spokane
27. Lewis	58. Middle Lake Roosevelt
28. Salmon-Washougal	59. Colville
29. Wind-White Salmon	60. Kettle
30. Klickitat	61. Upper Lake Roosevelt
31. Rock-Glade	62. Pend Oreille

CRITERIA : CATEGORY I (v) -Wetlands with irreplaceable ecological functions.

SUB-CRITERIA PEAT WETLAND

1) Peat wetlands without significant hydrologic modification where significant hydrologic modification is demonstrated by

a) Replacement of pre-settlement flora (if determined) by monotypic Spiraea (hardhack), reed canary grass or cattail; or

b) More than 70% of flora replaced by species in above; or

c) Evidence of drainage ditches, peat stockpiling, peat dredging or mining, removal of woody vegetation, plowing or planting i.e. corn ; or

d) Diversion of water source. The peat is dry and decomposing, often white and dry on surface, clearly oxidizing and disintegrating; or

e) Severe grazing, with evidence of heavy trampling, vegetation removal and nutrient addition.

SOURCE

See field methodology

JUSTIFICATION

Bogs and fens are very stable wetland types with peat soils which are very sensitive to disturbance. Bogs and fens form when organic material accumulates faster than it decomposes. Bog/fen systems form extremely slowly, at the rate of one inch per 40 years in western Washington and one inch per hundred years in eastern Washington. Bogs are hydrologically closed systems without flowing water. They are extremely acidic and low in nutrients and the plants which grow in them are specifically adapted to such conditions. Fens normally support a greater diversity of plant species and have greater amounts of available nutrients and a higher pH than bogs.

A variety of specialized plants live in bogs and fens. Most bog/fen plants have developed adaptations to survive in the acidic, low-nutrient environment. Thus, minor changes in the hydrology or nutrient levels in these systems can have major adverse impacts on the plant communities. Peat systems also provide significant habitat for a variety of wildlife species and perform important hydrologic functions including groundwater and stream recharge.

The vast majority of the bogs/fens observed in western Washington have been degraded through hydrologic modification and reduction in species diversity and integrity. In eastern Washington, peat mining is progressing at a significant and increasing rate. In addition, there is no known technology for replicating or creating a bog/fen.

SUB-CRITERIA FORESTED WETLANDS

If all of the following (1-4) are satisfied, a forested wetland is a Category I mature forested wetland.

1) Forested wetland where at least 50% of the tree canopy coverage is mature trees - trees [illegible] yrs or older for softwoods and 50 yrs or older for hardwoods; and

2) Prescence or seedlings or saplings of one or more of the dominant overstory tree species; and

3) Non-native species constitute less than 50% of herbaceous coverage; and

4) Area greater than 1 acre.

All other forested wetlands are rated according to remaining Category II, III criteria.

SOURCE

See field methodology

JUSTIFICATION

Forested wetlands are important because of the variety of functions that these wetlands provide and the very long time that they take to develop. Mature forested wetlands require at least 50 years to develop and are most valuable for wildlife habitat when left undisturbed for several generations.

Forested wetlands have exceptionally high functional values for wildlife habitat due to the multiple layers of vegetation which provide a variety of food, breeding and nesting sites, and thermal and hiding cover. Some forested wetlands are associated with standing water during all or part of the year which makes them extremely valuable, especially when the surrounding area is arid or semi-arid. Birds, mammals, and amphibians often reach their greatest densities and diversity within forested wetlands.

The tree canopy provides a moderated temperature within the wetland that is cooler in summer and warmer in winter than surrounding open areas and this reduces energy needs for wildlife. Trees may shade open water providing cover for fish, and downed trees provide large organic debris essential for fish habitat structure in streams. Leaves and insects which are important in the aquatic food-chain drop into the water from overhanging trees.

Riparian forested wetlands are those forested wetlands along streams and rivers. Riparian forests may contain both wetland and non-wetland forest components. Non-wetland riparian forests are extremely important as a transition between wetland and upland. In arid and semi-arid portions of eastern Washington, the non-wetland riparian forest is an integral part of the streamside habitat.

Flood waters are slowed and diminished as they spread out in riparian forested wetlands and the trees and other vegetation trap sediments from the flood waters. Sediments, shorelines and streamsides are stabilized by the extensive root systems and protected from erosion by vegetative cover.

SUB-CRITERIA ESTUARINE WETLANDS

If any of the following (1-3) are satisfied, an estuarine wetland is a Category I wetland

1) Listed as a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve or any preserve or reserve designated under WAC 332-30-151, or

2) Greater than five acres; or

3) Less than five acres and satisfies any four of the following:

- greater than 1 acre;

- contains at least two estuarine wetland habitat classes (Dethier, 1990;

- minimum existing evidence of human related physical alteration (e.g., diking, ditching, filling, cultivating, grazing or introduced species);

- contains functional tidal channel(s) or is connected to a tidal stream;

- within 1/4 mile of other water bodies (e.g., lakes or wetlands greater than one acre in size or streams or sloughs greater than 5 cubic feet/second mean annual flow);

- within a watershed that has little to moderate point or non- point water quality problems cited by the Department of Ecology

- adjacent land uses on more than 75 percent of the wetland border consist of either agriculture, relatively undisturbed forest, or open space or, if there are current or planned Industrial, Commercial, or Residential adjacent uses there is/will be a high quality buffer at least 100' wide.

SOURCE

See field methodology

JUSTIFICATION

Estuaries are among the most highly productive and complex ecosystems where tremendous quantities of sediments, nutrients and organic matter are exchanged between terrestrial, freshwater and marine communities. This availability of resources benefits an enormous variety of plants and animals. Fish, shellfish and birds are the most visible along with emergent plants, however, there is also a huge variety of other life-forms, for example; diatoms, algae and invertebrates.

Estuarine systems have substantial economic value as well as environmental value. All Washington state estuaries have been modified to some degree, bearing the brunt of development pressures through filling, drainage, port development, disposal of urban and industrial wastes. The over-harvest of certain selected economic species has also modified the natural functioning of estuarine systems. Many Puget Sound estuaries such as the Duwamish, Puyallup, Snohomish and Skagit have been extensively modified with losses of up to 99% of estuarine wetland area. Willapa Bay as a whole is probably the most pristine large estaurine wetland remaining in Washington State (Source: mostly Albright et.al. 1980). Even so,Willapa Bay has been modified by development.

SUBCRITERIA EEL GRASS BEDS and KELP BEDS

Is an Eel grass bed present?

Is floating or non-floating kelp bed present which has greater than 50% macro algal cover in the month of August or September?

SOURCE

See Field methodology

JUSTIFICATION

Broad bladed eel-grass *Zostera marina* is a vascular plant which grows in the marine environment. Together with floating kelp beds *Nereocycstis leutkeana* and *Macrocystis integrifolia* as well as other non-floating kelp species, these plants provide some of the most highly productive and unique habitats in the marine environment.

The importance of these plants in the ecosytem fall primarily into four areas: productivity, habitat, hydrodynamics and exploitative. Marine plants, particularly kelps, provide a major input of detritus and dissolved organic matter to the food web. They provide a significant habitat for a number of organisms as a place of refuge and a substrate for reproduction. Eelgrass and kelp beds reduce current flow and wave action, creating a protected environment and influencing beach slope stability. Finally , seaweeds are a source of human food, fodder, fertilizer and valuable extracted chemicals, Mumford, 1988.

CATEGORY II WETLANDS

CRITERIA : CATEGORY II (i) - Documented habitat for sensitive species of plant, animal or fish recognized by federal or state agencies.

SUB-CRITERIA - PLANT SPECIES

Does the wetland contain individuals of State-listed Sensitive plant species?

SOURCE OF INFORMATION

Contact the Washington Natural Heritage Program by mail to determine if any plant species of concern have been located in or near the study area. A sample letter is included in Figure 2. Send a general map of the study area along with township/range/section information. A fee is charged for a search of the Natural Heritage Program database.

Washington Natural Heritage Program
Department of Natural Resources
Division of Land and Water Conservation
Mail Stop: EX-13
Olympia, Washington 98504
206-753-2449

The Washington Natural Heritage Program maintains a comprehensive database of site-specific information on reported occurrences of Sensitive, Threatened, and Endangered plant species in Washington. Unidentified plant species collected during site visits should be identified only by qualified botanists familiar with the Pacific Northwest flora. Most wetlands in Washington have not been surveyed for the occurrence of State Sensitive, Threatened, and Endangered plant species.

JUSTIFICATION

Some species of Sensitive plants are found exclusively or predominantly in wetland habitats. Examples include interrupted sedge *Carex interrupta* scattered throughout Washington, and swamp gentian *Gentiana douglasiana* in Clallam and King Counties. Table 6 Shows State-listed Sensitive species that may be found in wetlands.

Table 6 State-listed Sensitive plant species that may be found in wetlands. (From Washington Natural Heritage Program 1990).

Adiantum pedatum ssp. subpumilum (dwarf maidenhair fern)
Aster junciformis (rush aster)
Bolandra oregana (bolandra)
Botrychium lanceolatum (lance-leaved grape-fern)
Botrychium lunaria (moonwort)
Botrychium minganense (Victorin's grape-fern)
Botrychium pinnatum (St. John's moonwort)
Botrychium simplex (little grape-fern)
Carex aenea (bronze sedge)
Carex anthoxanthea (yellow-flowered sedge)
Carex atrata var. atrosquama (blackened sedge)
Carex atrata var. erecta (erect blackened sedge)
Carex buxbaumii (Buxbaum's sedge)
Carex comosa (bristly sedge)
Carex densa (dense sedge)
Carex hystricina (porcupine sedge)
Carex interrupta (green-fruited sedge)
Carex macrochaeta (large-awn sedge)
Carex norvegica (Scandanavian sedge)
Carex pauciflora (few-flowered sedge)
Carex paupercula (poor sedge)
Carex pluriflora (several-flowered sedge)
Carex saxatilis (russet sedge)
Carex scirpoidea var. scirpoidea (Canadian single-spike sedge)
Carex scopulorum var. prinophylla (saw-leaved sedge)
Carex stylosa (long-styled sedge)
Carex sychnocephala (many-headed sedge)
Chrysosplenium tetrandum (northern golden-carpet)
Cicuta bulbifera (bulb-bearing water-hemlock)
Cimicifuga elata (tall bugbane)
Coptis asplenifolia (gold-thread)
Cyperus rivularis (shining flatsedge)
Dodecatheon pulchellum (few-flowered shooting star)
Eleocharis rostellata (beaked spike-rush)
Epipactis gigantea (giant helleborine)
Eriophorum viridicarinatum (green-keeled cotton-grass)
Erythronium revolutum (pink fawn-lily)
Fritillaria camchatcensis (black lily)
Gentiana douglasiana (swamp gentian)
Gentiana tenella (slender gentian)
Geum rivale (water avens)
Illiamna longisepala (longsepal globemallow)
Isoetes nuttallii (Nuttall's quillwort
Juncus kelloggii (Kellogg's rush)
Limosella acaulis (southern mudwort)
Listera borealis (northern twayblade)
Lobelia dortmanna (water lobelia)
Lycopodium inundatum (bog clubmoss)
Meconella oregana (meconella)

Mimulus pulsiferae (Pulsifer's monkeyflower)
Mimulus suksdorfii (Suksdorf's monkeyflower)
Montia diffusa (branching montia)
Muhlenbergia glomerata (Marsh muhly)
Oryzopsis hendersonii (Henderson's ricegrass)
Parnassia fimbriata var. hoodiana (fringed grass-of-Parnassus)
Parnassia kotzebuei (Kotzebue's grass-of-Parnassus)
Parnassia palustris (northern grass-of-Parnassus)
Pedicularis rainierensis (Mt. Rainier lousewort)
Platanthera obtusata (small northern bog-orchid)
Platanthera sparsiflora (canyon bog-orchid)
Potamogeton obtusifolius (blunt-leaved pondweed)
Puccinellia nutkaensis (Alaska alkaligrass)
Ranunculus longirostris (long-beaked water buttecup)
Salix candida (hoary willow)
Salix maccalliana (MacCall's willow)
Salix sessiliflora (soft-leaved willow)
Salix tweedyi (Tweedy's willow)
Samolus parviflorus (water pimpernel)
Sanicula marilandica (black snake-root)
Sanguisorba menziesii (Menzies' burnet)
Saxifraga integrifolia var. apetala (swamp saxifrage)
Sisyrinchium septentrionale (blue-eyed grass)
Spartina pectinata (prairie cordgrass)
Spiraea densiflora var. splendens (subalpine spirea)
Teucrium canadense ssp. viscidum (woodsage)
Thalictrum dasycarpum (purple meadowrue)
Tillaea aquatica (pygmy-weed)
Tillaea erecta (erect pygmy-weed)
Utricularia intermedia (flat-leaved bladderwort)
Vacinnium myrtilloides (blueberry)

SUB-CRITERIA - ANIMAL SPECIES

Does the wetland contain documented habitat for State- listed or candidate sensitive wildlife species managed by the Washington Department of Wildlife?

SOURCE OF INFORMATION - See CATEGORY I(i).

JUSTIFICATION

Relatively few State listed or candidate Sensitive species are confined to wetland habitats. One example is the spotted frog *Rana pretiosa*, a candidate Sensitive species. Other candidate Sensitive species, such as the Vaux's swift *Chaetura vauxi* and the pileated woodpecker *Dryocopus pileatus* use forested wetlands as well as other habitats.

SUB-CRITERIA - FISH SPECIES

Does the wetland contain documented habitats of State or Federally listed or candidate Sensitive fish species managed by the Washington Department of Wildlife or the Washington Department of Fisheries?

SOURCES OF INFORMATION

Washington Department of Wildlife
Nongame Program
c\o Mail Stop EX-12
Olympia, Washington 98504
(206) 586-1449

or

Washington Department of Fisheries
115 General Administration Building
Olympia, Washington 98507
206-753-6650

JUSTIFICATION

At the time of this publication, no fish species or races are currently listed or candidate State or Federal Sensitive species.

CRITERIA : CATEGORY II (ii) - Documented priority habitats and species recognized by state agencies.

SUB-CRITERIA-WILDLIFE SPECIES

Does the wetland contain priority species or habitats documented by Washington Department of Wildlife's Priority Habitats and Species Program?

SOURCE OF INFORMATION

Washington Department of Wildlife
Nongame Program
c\o Mail Stop EX-12
Olympia, Washington 98504
(206) 586-1449

or

Washington Department of Wildlife
Priority Habitat and Species Program
600 Capitol Way
Olympia, Washington 98501
(206) 753-3318

The Washington Department of Wildlife, through its Priority Habitat and Species Program, plans to establish a database documenting locations of areas with high abundance or diversity of wildlife. The database is not expected to be complete until about 1993.

Few wetlands in Washington have been surveyed for wildlife diversity or abundance.

Contact the Department of Wildlife by mail to determine if a high diversity or large concentration of wildlife has been documented in or near the wetland being studied. A sample letter is included as Figure 3. Send a general map showing the location of the wetlands along with township/range/section information. A fee may be charged for a search of the database.

SUB-CRITERIA - FISH SPECIES

Does the wetland provide habitat for priority fish species managed by the Washington Department of Wildlife?

SOURCE OF INFORMATION

The presence of a priority fish species in a river or stream reach can be identified from the Washington Department of Wildlife's WARIS database, or by consulting Washington Department of Wildlife biologists. A list of priority fish species is provided in Table 6

Washington Department of Wildlife
Nongame Program
c\o Mail Stop EX-12
Olympia, Washington 98504
(206) 586-1449

or

Washington Department of Fisheries
115 General Administration Building
Olympia, Washington 98507
206-753-6650

TABLE 6 . Priority fish species managed by Washington Department of Wildlife.

Common Name	Scientific Name	Special Designation
Bull Trout	Salvelinus confluentus	FC2
Dolly Varden	Salvelinus malma	
Kokanee Salmon	Oncorhynchus nerka	
Mountain Sucker	Catostomus platyrhynchus	SC
Mountain Whitefish	Prosopium williamsoni	
Olympic Mudminnow	Nuvumbra hubbsi	FC2,SC
Pygmy Whitefish	Prosopium coulteri	SC
Rainbow and Steelhead Trout	Oncorhynchus mykiss	
Westslope Cutthroat Trout	Oncorhynchus clarki	

SC = State Species of Concern
FC2 = Proposed Federal Threatened, Candidate 2 status

CRITERIA : CATEGORY II (iii) - Wetlands with significant functions which may not be adequately replicated through creation or restoration.

This category is a default. Wetlands in this Category include peat wetlands that have significant hydrologic modification, forested wetlands not satisfying the mature forested wetland criteria but still having significant habitat value, and estuarine wetlands and kelp beds that do not satisfy Category I criteria

CATEGORY II (iv) - Wetlands with significant habitat value (Freshwater Wetlands)

SUB-CRITERIA

Is the habitat score for significant habitat value greater than or equal to 10points.

SOURCE OF INFORMATION

See field methodology

JUSTIFICATION

This value was selected in order to separate wetlands which have characteristics that indicate significant habitat for wildlife species (mammals, birds, amphibians, etc.) and to protect them accordingly.

CATEGORY IV WETLANDS

CRITERIA : CATEGORY IV WETLANDS

a) Is the wetland hydrologically isolated, < 1acre, with one vegetated class and dominated (>50%) by one native species from Table 7, ;

or b) Is the wetland hydrologically isolated, < two acres, with one vegetated class, and 90% of plant cover composed of species from Table 8 .

SOURCE OF INFORMATION

See field methodology, and Tables 7 and 8 below

Table 7. List of native species for determination of Category IV wetlands	
Small fruited bullrush	*Scirpus microcarpus*
Hard hack	*Spirea douglasii*
Cattail	*Typha latifolia*

Table 8. List of invasive exotic plant species for determination of Category IV wetlands	
Purple loosestrife	*Lythrum salicaria*
Townsend's cordgrass	*Spartina townsendii*
Canada thistle	*Cirsium arvense*
Himilayan blackberry	*Rubus discolor*
Reed canarygrass	*Phalaris arundinacea*
Velvet grass	*Holcus lanatus*
Foxtail	*Alopecurus pratensis*
Soft Rush	*Juncus effusus*
Reed	*Phragmites communis*
Orchard grass	*Dactylis glomerata*
Buttercup	*Ranunculus repens*

JUSTIFICATION

Category IV wetlands provide important functions including wildlife habitat, groundwater recharge, water quality improvement and recreation and aesthetic values. Many of these wetlands are degraded.

WETLANDS OF LOCAL SIGNIFICANCE

CRITERIA : CATEGORY I, II or III WETLANDS OF LOCAL SIGNIFICANCE - Any wetland, identified and adopted by a local government as part of it's planning process, following public review and appeals, and satisfying sub-criteria below.

[illegible]

a) is locally rare, or

b) is documented as a groundwater recharge area, or contributes functional value to a local government water quality or flood mitigation program, or

c) provides habitat for fish and wildlife that is considered important by the local community, or

d) is a recognized or planned educational site, or

e) is part of a recognized or planned recreation resource, or

f) is part of an open space or planned open space resource, or

g) is planned for restoration or enhancement as a part of a local government protection program, or

h) is part of a wildlife corridor or connects wetland areas of greater value, or

i) is recognized and valued as a part of the local landscape, or

j) is considered sensitive to development or disturbance, or

k) is considered irreplaceable, or

l) is a buffer area for a growth management boundary, or

m) is an integral part of a wetland system that would benefit from better overall protection, or

n) is part of a flyway for migratory birds, or

o) satisfies other criteria developed by local government.

SOURCE

The use of the wetland of local significance concept should be fully described within the planning documents of the local jurisdiction. In order to be recognised as WOLS, each wetland should be specifically identified and adopted as a "wetlands of local significance" under local legislative Authorities.

JUSTIFICATION

The purpose of criteria for wetlands of local significance (WOLS) is to provide ways for local government to protect wetlands within the wetlands rating system to a degree higher than that afforded by strict application of the other state or regional criteria.

By using the WOLS concept a local government could promote an otherwise Category IV wetland to Category III, II or I protection levels, promote an otherwise Category III wetland to Category II or I protection levels, or promote an otherwise Category II wetland to Category I protection levels.

WOLS could also be identified and categorized on the basis of inter-local agreements where local government boundaries arbitrarily divide a wetland. This would be essential when additional protection of a watershed-wide wetland function was sought (i.e. flood-storage capacity) and the watershed is divided by multiple jurisdictions.

For inventory purposes, WOLS would be identified on the basis of strict application of the criteria, regardless of the level of protection afforded them. It would not allow a reduction of protection to wetlands where protection is already required by state or federal law.

GLOSSARY

Estuaries are waters that are semi-enclosed by land with open, partly obstructed sporadic access to the ocean, and in which seawater is at least occasionally diluted by freshwater run-off from the land. Estuarine boundaries extend upstream and landward to where ocean derived salts measure less than 0.5 ppt during the period of average annual low flow, and downstream or out to sea where freshwater dilution is minimal (salinities seldom fall below 30 ppt). An estuarine wetlands is defined as the intertidal subsystem described by Dethier et al [illegible] as the strata from [illegible] tides (ELWS =ELLW) to upper limit or influence of ocean-driven salts.

Forested wetland is a wetland or homogeneous stand within a wetland complex whose upper layer of vegetation consists of trees with a canopy coverage of 30% or more (adapted from Cowardin et. al. 1979). For the purposes of this rating system, a mature forested wetland is a forested wetland with an overstory dominated by mature trees having a wetland indicator status of facultative (FAC), facultative-wet (FACW), or obligate wetland (OBL) (Reed, 1988) and with more than one age class/size present. Mature trees are considered to be trees that are over 50 years old for hardwood species. The prescence of young trees of the dominant overstory species is an indicator of long-term persistence on the site.

Hydrologically isolated wetland means those regulated wetlands which 1) have no surface water connection to a lake, river or stream; 2) are outside of and not contiguous to any 100-yr floodplain of a lake, river, or stream; and 3) have no contiguous hydric soil between the wetland and any surface water.

Peat Wetlands means wetlands ith undrained hydric organic soils.

Plant Association means climax stands of vegetation in which the dominant species of corresponding layers are essentially the same, to the extent that any differences in composition are due to chance dissemination rather than to a fundamental dissimilarity in habitat potential.

Priority Habitat: A seasonal range or habitat element with which a given species has a primary association, and which, if altered, may reduce the likelihood that the species will maintain or increase population over the long term. These might include areas of high relative density, breeding habitat, winter range, and movement corridors. Priority habitats might also include areas that are of limited availability or high vulnerability to alteration, such as cliffs, talus, wetlands, etc.

Priority Species: Animal species that are of concern due to their population status and their sensitivity to habitat manipulation. Priority species include species of concern, monitor species, priority game species, as well as other game and nongame species.

Species of Concern: are those animal species that are listed or candidates for designation as Endangered, Threatened, or Sensitive by the Washington Department of Wildlife.

State Endangered Species are those that are seriously threatened with extirpation throughout all or a significant portion of their range within Washington.

State Monitor Species: Those animal and plant species of special interest because they: 1) have significant popular appeal; 2) require limited habitat during some portion of their life cycle; 3) are indicators of environmental quality; 4) require further field investigations to determine population status: 5) have unresolved taxonomic problems that may bear upon status classification; or 6) were justifiably removed from Endangered, Threatened, or Sensitive status.

State Potentially Extirpated Plant Species: Also referred to as Possibly Extinct or Possibly Extirpated. Plant taxa thought to be extinct or extirpated in Washington. Plants in this category are all high priorities for field investigation. If found, they will be assigned Endangered, Threatened, or Sensitive status.

State Priority Game Species: Hunted species whose populations have declined from historic levels to a point where they require intensive management, due largely to habitat loss or other human disturbance.

State Sensitive Species: Animal and plant species that could become Threatened in Washington due to limited population size and distribution, sensitivity to disturbance during critical stages in their life cycle, or dependence on a very specific habitat type.

State Threatened Species: Animals and Plant species are those that are not presently Endangered in Washington but could become so in the foreseeable future.

REFERENCES CITED

Albright, R., Hirschi, R., Vanbianchi, R. and Vita, C. 1980. Coastal Zone Atlas of Washington State. Washington Department of Ecology, Olympia.

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetland and deepwater habitats of the United States. U.S. Fish and Wildlife Service, Office of Biological Services. Washington, D.C. Publication No. FWS/OBS-79/31. 107pp.

Dethier, M.N. et.al. 1990. A Marine and Estuarine Habitat Classification System for Washington State. Department of Natural Lands, Olympia, Washington.

Mumford, T.F. 1988. Marine Plants on State-Owned Aquatic Lands: Their Status and Management. Proceedings of the First Annual Meeting on Puget Sound Research. Puget Sound Water Quality Authority, Seattle.

Reed, P.B., Jr. 1988. National list of plant species that occur in wetlands: Northwest (Region 9). U.S. Fish and Wildlife Service, Biological Report 88(26.9). 89pp.

Washington Natural Heritage Program. 1990. Endangered, threatened, and sensitive vascular plants of Washington. Department of Natural Resources, Olympia, Washington.

FIGURE 2.
SAMPLE LETTER TO WASHINGTON NATURAL HERITAGE PROGRAM TO REQUEST INFORMATION

__ ______ 1991

Data Manager
Washington Natural Heritage Program
Department of Natural Resources
Mail Stop EX-13
Olympia, Washington 98504

To Whom This Concerns,

________ is planning to (describe activity) in the ______ drainage, approximately _ miles (insert direction) of the town of ________, (R.—, T.—, Sec.–). The area of the proposed activity contains (a) wetland(s).

Therefore we are requesting that the Washington Natural Heritage Program answer and document the following questions for this/these wetland(s):

> Does the wetland contain individuals of Federal or State-listed Threatened or Endangered plant species; or is the wetland an historic location of a plant species thought to be possibly Extinct or Extirpated from Washington?
>
> Is the wetland already on record with the Washington Natural Heritage Program as a high quality native wetland?
>
> Does the wetland contain individuals of State-listed Sensitive plant species?

Enclosed are maps of the proposed activity and the location of the wetland(s). We understand that we will be billed and must remit payment prior to receiving the results of the data search. If you have any questions, please contact _______ at ( ) ____.

Thanks in advance for your help.

Sincerely,

enclosures: Map of ______________________________

FIGURE 3.
SAMPLE LETTER TO WASHINGTON DEPARTMENT OF WILDLIFE TO REQUEST INFORMATION

__ ______ 1991

Database Manger
Nongame Program
Washington Department of Wildlife
Mail Stop EX 12
Olympia, Washington 98504

To Whom This Concerns:

________ is planning a (describe the activity) in the ______ drainage, approximately __ miles (direction) of the town of __, (R.—, T.—, Sec.–). The area of the proposed harvest contains (a) wetland(s).

Therefore we are requesting that the WDW answer and document the following questions for this/these wetland(s):

> Does the wetland contain documented priority habitats for State-listed or candidate Threatened or Endangered wildlife species managed by the Washington Department of Wildlife?
>
> Does the wetland contain documented habitats of State or Federally listed or State or Federal candidate Threatened or Endangered fish species, or races of fish, managed by the Washington Department of Wildlife or the Washington Department of Fisheries?
>
> Is the wetland documented as habitat of regional (Pacific Coast) or national significance for migratory birds?
>
> Does the wetland contain documented habitat for State-listed or candidate sensitive wildlife species managed by the Washington Department of Wildlife?
>
> Does the wetland contain priority species or habitats documented by Washington Department of Wildlife's Priority Habitats and Species Program.

Enclosed are maps of the proposed activity and the location of the wetland(s). We understand that we will be billed and must remit payment prior to receiving the results of the data search. If you have any questions, please contact _______ at ( )____.

Sincerely,

enclosure: Map of ____________________________

FIGURE 4

SAMPLE LETTER TO WASHINGTON DEPARTMENT OF FISHERIES TO REQUEST INFORMATION

__ ___ _ 1991

Data Base Manager
Washington Department of Fisheries
115 General Administration Building
Olympia, Washington 98507

To Whom This Concerns:

________ is planning a (describe the activity) in the ______ drainage, approximately _ miles (direction) of the town of __, (R.---, T.---, Sec.--). The area of the proposed harvest contains (a) wetland(s).

Therefore we are requesting that WDF answer and document the following questions for this/these wetland(s):

> Does the wetland contain documented habitats of State or Federally listed or State or Federal candidate Threatened or Endangered fish species, or races of fish, managed by the Washington Department of Wildlife or the Washington Department of Fisheries?
>
> Does the wetland contain documented habitats of State or Federally listed or candidate Sensitive fish species managed by the Washington Department of Wildlife or the Washington Department of Fisheries?

Enclosed are maps of the proposed activity and the location of the wetland(s). We understand that we will be billed and must remit payment prior to receiving the results of the data search. If you have any questions, please contact _______ at ( ) ____.

Sincerely,

enclosure: Map of ___________________________

ATTACHMENT N-7

Wyoming Wetlands Act

(ORIGINAL SIGNED BY
PRESIDENT AND SPEAKER)

SIGNED BY GOVERNOR

DATE: 2-22-91

CHAPTER NO: 110

ORIGINAL HOUSE
BILL NO. 0048A

ENROLLED ACT NO. 74, HOUSE OF REPRESENTATIVES

FIFTY-FIRST LEGISLATURE OF THE STATE OF WYOMING
1991 GENERAL SESSION

AN ACT to create W.S. 35-11-308 through 35-11-311; and to amend W.S. 35-11-103(c)(vi) and by creating new paragraphs (x) through (xiii) relating to wetlands; requiring notification prior to draining a wetland as specified; providing definitions; providing for guidelines; and providing for an effective date.

Be It Enacted by the Legislature of the State of Wyoming:

Section 1. W.S. 35-11-308 through 35-11-311 are created to read:

35-11-308. Short title. This act, W.S. 35-11-308 through 35-11-311, may be known and shall be cited as the "Wyoming Wetlands Act".

35-11-309. Legislative policy and intent.

(a) The legislature declares that all water, including collections of still water and waters associated with wetlands within the borders of this state are property of the state. The legislature further declares that water is one of Wyoming's most important natural resources, and the protection, development and management of Wyoming's water resources is essential for the long-term public health, safety, general welfare and economic security of Wyoming and its citizens.

(b) The legislature finds that agriculture, energy development and timbering are important industries in this state and that industrial concerns must be accommodated in the protection of wetlands. Wetlands can have an impact on industry practices. Even though property taxes are generally paid on such lands, wetlands provide limited economic return to the landowner. Wetland policies can obstruct water development projects and water management projects for private industry as well as public entities and can affect other developments.

(c) The legislature finds that the primary reason wetlands are considered important is because wetlands provide the habitat base for the production and maintenance of waterfowl. The legislature also finds that wetlands can moderate the water flow and have value as natural flood control mechanisms, can aid in water purification by trapping, filtering and storing sediment and other pollutants and by recycling nutrients, and can serve as ground water recharge and discharge areas. Wetlands also function as nursery areas for numerous aquatic animal species and are habitat for a wide variety of plant and animal species, and provide vital habitat for resident wildlife. Wetlands also can provide scientific, aesthetic and recreational benefits. The legislature therefore concludes that wetlands and values associated therewith deserve to be effectively managed, protected and preserved.

(d) The legislature recognizes that significant differences exist in Wyoming between naturally occurring wetlands and those wetlands that result from human activities. Because portions of Wyoming are arid or semiarid, water was diverted from streams and rivers for irrigating cropland, resulting in the creation of wetlands. These wetlands have partially compensated for wetlands losses. Additionally, road and highway construction, petroleum industry operations and other human activities have created wetlands where none previously existed. While these man-made wetlands are equally as important as naturally occurring wetlands, having the same characteristics and providing the same values and functions, management flexibility is required to acknowledge their different origins and to protect the property rights of landowners and water right holders.

(e) In view of the legislative findings and conclusions of the importance of wetlands, water development and management, and industry in Wyoming it is hereby declared to be the wetlands policy of this state that water management and development and wetland preservation activities should be balanced to protect and accommodate private property, industry, water and wetland interests and objectives.

ORIGINAL HOUSE
BILL NO. 0048A

ENROLLED ACT NO. 74, HOUSE OF REPRESENTATIVES

FIFTY-FIRST LEGISLATURE OF THE STATE OF WYOMING
1991 GENERAL SESSION

35-11-310. Notice to drain waters required; exception.

(a) Except as provided in subsection (b) of this section, after July 1, 1996, no person shall drain water from a naturally occurring or man-made wetland, or any series thereof, which has an area comprising five (5) acres or more, without first notifying the department that the water which will be drained from the wetland, or any series thereof, will not flood or adversely affect downstream lands. Notification shall include the size and location of the wetland, and whether the wetland is natural or man-made.

(b) Subsections (a) and (c) of this section do not apply to disturbances of wetlands resulting from mining operations conducted pursuant to mining permits issued by the department of environmental quality.

(c) Any person draining, or causing to be drained, water of a naturally occurring wetland, or any series thereof, which has an area comprising five (5) acres or more, without first notifying the department as required by subsection (a) of this section, shall not be eligible to participate in the mitigation credit banking system as provided by W.S. 35-11-311. Failure to notify the department pursuant to this section does not constitute a violation for purposes of W.S. 35-11-901.

35-11-311. Mitigation; guidelines.

(a) The department in conjunction with the Wyoming department of agriculture shall adopt guidelines for evaluating ecological function and values and for establishing and administering a mitigation credit banking system for compensatory mitigation. The guidelines shall, at a minimum, provide for:

(i) Criteria under which mitigation credits may be earned, with credit to be recognized for man-made wetlands that have already been created;

(ii) Geographical limitations for the application of mitigation bank credits;

(iii) Criteria for the use, banking or sale of banked credits;

(iv) The approval by the department for the earning, using, banking, transfer or selling of mitigation bank credits; and

(v) Requirements for the maintenance and submission by the department of records concerning ecological value losses, and credit and debit accounts for each mitigation bank.

Section 2. W.S. 35-11-103(c)(vi) and by creating new paragraphs (x) through (xiii) is amended to read:

35-11-103. Definitions.

(c) Specific definitions applying to water quality:

(vi) "Waters of the state" means all surface and ground water, including waters associated with wetlands, within Wyoming;

(x) "Wetlands" means those areas in Wyoming having all three (3) essential characteristics:

(A) Hydrophytic vegetation;

(B) Hydric soils; and

(C) Wetland hydrology.

(xi) "Compensatory mitigation" means replacement, substitution, enhancement or protection of ecological functions and values to offset anticipated losses of those values caused by

ORIGINAL HOUSE
BILL NO. 0048A

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draining a wetland;

(xii) "Ecological function and value" means the ability of an area to support vegetation and fish and wildlife populations, recharge aquifers, attenuate flooding and trap sediment;

(xiii) "Mitigation" means all actions to avoid, minimize, restore and compensate for ecological values lost.

Section 3. This act is effective July 1, 1991.

(END)

Speaker of the House

President of the Senate

Governor

TIME APPROVED: ____________

DATE APPROVED: ____________

(ORIGINAL SIGNED BY
PRESIDENT AND SPEAKER)
SIGNED BY GOVERNOR
DATE: 2-22-91
CHAPTER NO: 110

ATTACHMENT N-8

Wetland Inventory and Wetland Conservation Plans for Oregon

WETLAND INVENTORY and WETLAND CONSERVATION PLANS

ORS 196.668 — 196.692

Effective Date:

September 1989

1859

Division of State Lands
Environmental Planning
and Permits Section
775 Summer Street NE
Salem, Oregon 97310
(503) 378-3805

INDEX

Statute (O.R.S.)

WETLAND INVENTORY AND WETLAND CONSERVATION PLANS

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Wetland Conservation Plans

(Wetland Conservation Plans)

196.668 Legislative findings. The Legislative Assembly finds that:

(1) Wetlands provide a natural means of flood and storm damage protection through the absorption and storage of water during high runoff periods, thereby reducing flood crests and preventing loss of life and property;

(2) Wetlands provide essential breeding, spawning, rearing, feeding, nesting and wintering habitats for a major portion of this state's fish and wildlife;

(3) Wetlands provide essential habitat for waterfowl using the Pacific Flyway and for the rearing of salmon and other anadromous and resident fish;

(4) Wetlands act as accumulation areas for sediments which retain nutrients and other pollutants that may prevent entry of the pollutants into other waterways;

(5) Wetlands provide a valuable public service of maintaining clean water by retaining nutrients, metals and toxic materials from the water to protect water quality;

(6) Wetlands provide significant opportunities for environmental and ecological research, public recreation and education and provide scenic diversity and aesthetic value as open space and areas of visual enjoyment;

(7) Much of this state's original wetlands have been diked, drained, filled, dredged, ditched or otherwise altered;

(8) There is continuing development pressure on wetlands in Oregon;

(9) There are often conflicts between wetland protection and other resource values and uses;

(10) Uncoordinated regulation of wetlands by local, state and federal agencies can cause confusion, frustration and unreasonable delay and uncertainty for the general public; and

(11) Wetland management is a matter of this state's concern since benefits and impacts related to wetland resources can be international, national, regional and state wide in scope. [1989 c.837 §2]

196.670 [Formerly 541.605; renumbered 196.800 in 1989]

196.672 Policy. In addition to the policy described in ORS 196.805, it is the policy of the State of Oregon to:

(1) Promote the protection, conservation and best use of wetland resources, their functions and values through the integration and close coordination of state-wide planning goals, local comprehensive plans and state and federal regulatory programs.

(2) Use a single definition of "wetlands" for the purposes of ORS 196.800 to 196.905 and state-wide planning goals and a single, uniform methodology of delineating wetland boundaries.

(3) Develop a state-wide inventory of wetlands based on uniform identification standards and criteria at a scale practicable for planning and regulatory purposes, and to make such inventory available to state agencies and local governments to facilitate better management of wetland resources and closer coordination of local, state and federal wetland programs.

(4) Maintain a stable resource base of wetlands through the mitigation of losses of wetland resources and the adoption of the procedural mitigation standard currently used by federal agencies.

(5) Establish the opportunity to increase wetland resources by encouraging wetland restoration and creation where appropriate.

(6) Reduce the delays and uncertainty which can occur in the current wetland planning and regulatory framework through improved coordination of the provisions in ORS 196.800 to 196.905 with local land use planning and regulation and by providing mechanisms for expedited permit review consistent with the protection and conservation of wetland resources.

(7) Continue to meet the requirements of federal law in the protection and management of wetland resources, while asserting the interests of this state, in concert with those of local governments in urging the federal resource and regulatory agencies to develop a uniform wetland policy and more consistent, cohesive standards to implement the Federal Water Pollution Control Act (33 U.S.C. 1344).

(8) Develop and provide information to the general public concerning the functions, values and distribution of wetlands of this state to raise public awareness of these resources.

(9) Promote the protection of wetland values on private lands by developing and using public recognition programs, incentives and other nonregulatory actions.

(10) Encourage wetlands as an interim use of mining and construction sites on lands that were not originally wetlands and are designated for other than wetland purposes in an acknowledged comprehensive plan,

while insuring that interim wetland use does not limit the future use of such sites for mining and construction. [1989 c.837 §3]

196.674 State-wide Wetlands Inventory. (1) The division shall compile and maintain a comprehensive State-wide Wetlands Inventory.

(2) In compiling the State-wide Wetlands Inventory, the division shall develop, by rule, a system for uniform wetland identification, delineation and comprehensive mapping. Initial inventories shall be based upon the National Wetlands Inventory prepared by the United States Department of the Interior, Fish and Wildlife Service. The division shall consult with the public, local governments and affected state and federal agencies concerning the accuracy of the inventory.

(3) The division shall revise the inventory maps as new or more complete information becomes available.

(4) The division shall provide each city and county planning office with copies of the State-wide Wetlands Inventory covering the local jurisdiction.

(5) The division shall provide each state agency with a copy of the inventory upon request.

(6) Copies of the State-wide Wetlands Inventory shall be made available to the general public, through the division, upon payment of a fee to offset administrative and reproduction costs.

(7) A wetland inventory developed by another party may be utilized by the division if it is consistent with standards adopted pursuant to this section, after consulting with the affected local government, and is reviewed and approved by the division as complying with the standards adopted pursuant to subsection (2) of this section.

(8) Nothing in this section shall restrict the regulatory jurisdiction of the division under ORS 196.800 to 196.905.

(9) In compiling and updating the State-wide Wetlands Inventory, the division shall identify opportunities for wetland creation, restoration and enhancement when the information is available. [1989 c.837 §6]

196.675 [Formerly 541.610; renumbered 196.805 in 1989]

196.676 Response to notices from local governments. The division shall respond to the notice received from local governments pursuant to ORS 215.418 (1) and 227.350 (1) within 30 days of receipt of the notice. The response shall state whether a permit is or in the future will be required or whether a permit has been issued by the division for the activity which is subject to notice. [1989 c.837 §7]

196.678 Wetland conservation plans; contents; procedure for adopting. (1) Any city or county may develop and submit to the division a wetland conservation plan for review pursuant to the provisions of ORS 196.678 to 196.684.

(2) A wetland conservation plan shall include the following elements:

(a) A description and maps of the area to be covered by the plan;

(b) A detailed inventory of the wetlands, identifying the location, quality and quantity of the wetland resource and the source of the water for the wetlands within the area covered by the plan;

(c) An assessment of wetland functions and values, including an historical analysis of wetland degradation, alterations and losses;

(d) Designation of wetland areas for protection, conservation or development. Wetlands within areas designated for development shall be delineated to determine regulatory boundaries;

(e) A mitigation plan, including a program for replacement of planned wetland losses and restoration of lost functions and values through creation of new wetlands or enhancement of existing wetland areas which designates specific sites within the plan area and actions for restoration and enhancement;

(f) Policies and implementing measures establishing protection, conservation and best use of the wetlands in the plan area;

(g) Specification of sites for fill or removal, or both, and the conditions and procedures under which fill or removal, or both, may occur;

(h) Monitoring provisions that insure the wetland mitigation measures are implemented and mitigation goals are achieved;

(i) Identification of public uses of the wetlands and waters and conflicting planned uses; and

(j) Specification of buffer areas and uses allowed on lands which are adjacent to wetlands and which are necessary to maintain, protect or restore wetland functions and values.

(3) The proposed wetland conservation plan shall be adopted by the affected local government according to the procedures set forth in ORS 197.610 to 197.625. [1989 c.837 §10]

196.680 [Formerly 541.615; renumbered 196.810 in 1989]

196.681 Duties of division; standards for approval of plan; conditions for approval; order. (1) In accordance with rules adopted pursuant to this chapter, the division shall:

(a) Review any proposed wetland conservation plan or proposed amendment to an approved wetland conservation plan against the standards in this section;

(b) Prepare a proposed order that approves, approves with conditions or denies the proposed wetland conservation plan or proposed amendment to an approved wetland conservation plan;

(c) Provide notice and the opportunity for public hearing and comment on the proposed order;

(d) Consult with affected local, state and federal agencies; and

(e) Consider the applicable findings made in the order of acknowledgment issued by Land Conservation and Development Commission.

(2) The director may approve by order a wetland conservation plan that includes the necessary elements of ORS 196.678 (2) and meets the standards of subsections (3) and (4) of this section.

(3) A wetland conservation plan shall comply with the following standards:

(a) Uses and activities permitted in the plan including fill or removal, or both, conform to sound policies of conservation and will not interfere with public health and safety;

(b) Uses and activities permitted in the plan including fill or removal, or both, are not inconsistent with the protection, conservation and best use of the water resources of this state and the use of state waters for navigation, fishing and public recreation; and

(c) Designation of wetlands for protection, conservation and development is consistent with the resource functions and values of the area and the capability of the wetland area to withstand alterations and maintain important functions and values.

(4) Wetland areas may be designated for development including fill or removal, or both, only if they meet the following standards:

(a) There is a public need for the proposed uses set forth in the acknowledged comprehensive plan for the area;

(b) Any planned wetland losses shall be fully offset by creation, restoration or enhancement of wetland functions and values or in an estuarine area, estuarine resource replacement is consistent with ORS 196.830; and

(c) Practicable, less damaging alternatives, including alternative locations for the proposed use are not available.

(5) Approval by the director of a wetland conservation plan shall be conditioned upon adoption by the affected local governments of comprehensive plan policies and land use regulations consistent with and sufficient to implement the wetland conservation plan. Appropriate implementing measures may include the following planning and zoning requirements regulating:

(a) Adjacent lands or buffer areas necessary to maintain, protect or restore wetland functions and values, including riparian vegetation, and the uses to be allowed in those areas;

(b) Sites for mitigation of impacts from development activities;

(c) Upland areas adjacent to wetlands; and

(d) Activities or location of buildings, structures and improvements which may affect wetland values or functions, such as storm water runoff.

(6) The director shall issue an order approving, approving with conditions or denying a wetland conservation plan, including a clear statement of findings which sets forth the basis for the approval, conditioning or denial. The order shall include:

(a) A clear statement of findings that the elements specified in ORS 196.678 (2) have been developed;

(b) The findings in support of the determination of compliance or noncompliance with the standards in subsections (3) and (4) of this section; and

(c) The conditions under which fill or removal or both may occur.

(7) The director may, as a part of an order approving a plan, authorize site-specific fill or removal without an individual permit as required by ORS 196.810 provided that:

(a) The director adopts findings demonstrating that fill or removal for any proposed project complies with ORS 196.682 (1)(a) to (e); or

(b) The director adopts findings that specific areas of fill or removal within areas designated as development in the plan meet the following standards:

(A) The fill or removal approved by the order will result in minimal impacts to the wetland system in the planning area;

(B) The public need for the proposed area of fill or removal outweighs the environmental damage likely to result from full development;

(C) The director conditions any such order as necessary to insure that the fill or removal, or both, is designed to minimize impacts from implementing the project; and

(D) Full replacement of wetland losses is provided through creation, restoration or enhancement of wetlands with comparable functions and values.

(8) Upon a finding by the director that a fill or removal, or both, authorized under paragraph (b) of subsection (7) of this section has caused or is likely to cause more than minimal adverse impact to the wetland system considering required mitigation conditions, the director shall revise the order to require individual permit review according to ORS 196.682 or provide additional conditions to insure that adverse impacts are minimal. Such revision shall not be subject to ORS 196.684. [1989 c.837 §11]

196.682 Permits required for removal or fill; conditions on issuance of permit. (1) Except where otherwise provided by the order approving the plan, individual permit applications shall be required for removal or fill, or both, in areas subject to an approved wetland conservation plan. If individual permit applications are to be reviewed under the authority of the director, then application fees and review procedures shall be in accordance with ORS 196.815, 196.825 (5) and (6) and 196.835. In lieu of the substantive standards for permit issuance in ORS 196.815 (1) and 196.825 (1), (2) and (3), the division shall issue a permit if the removal or fill, or both, is consistent with the wetland conservation plan or can be conditioned to be consistent with the plan. The division shall condition any such permit as necessary to insure that the project:

(a) Is properly designed or configured to minimize the need for alterations to waters of the state;

(b) Is the minimum size necessary to reasonably provide for the proposed use;

(c) Complies with applicable provisions of the acknowledged comprehensive plan and land use regulations for the area;

(d) Is designed to minimize impacts from implementing the project; and

(e) Is conditioned to insure wetland creation, restoration or enhancement measures are implemented to fully replace impacted resources.

(2) In any order approving a plan which authorizes any fill or removal or both, without the necessity of subsequently obtaining an individual permit, the director shall condition such approval as necessary to insure that the project complies with the conditions of subsection (1) of this section and clearly delineates the wetland area in which fill or removal, or both, is to occur. [1989 c.837 §12]

196.684 Amendment of plans; review of plans by division; review of orders by Land Use Board of Appeals. (1) Local governments shall provide notice to the division of any proposed amendments to the land use plan and ordinances affecting lands subject to a wetland conservation plan approved under this section.

(2) Amendments to plan policies, maps and implementing ordinances by the local government within an approved wetland conservation plan shall be reviewed by the division against the requirements of this section. These provisions do not exempt local governments from the provisions of ORS 197.610 to 197.625.

(3) The director shall provide notice and the opportunity for public comment and hearing as defined by rule on the matter of including the amendment in the wetland conservation plan.

(4) If the director finds that the proposed local government amendment to acknowledged comprehensive plan and land use regulations meets the requirements of ORS 196.681, the director shall approve the plan by order, and notify the local government within 10 days of the completion of the public review provided in subsection (3) of this section.

(5) If the amendments to acknowledged comprehensive plan and land use regulations adopted by the local government are determined not to comply with the requirements of ORS 196.668 to 196.692, 196.800, 196.810, 196.825, 196.830, 196.850 to 196.860, 196.885, 196.905, 197.015, 197.279, 215.213, 215.283, 215.418 and 227.350, the director shall revoke the approval order or amend the order to insure compliance with the requirements of ORS 196.668 to 196.692, 196.800, 196.810, 196.825, 196.830, 196.850 to 196.860, 196.885, 196.905, 197.015, 197.279, 215.213, 215.283, 215.418 and 227.350.

(6) The division shall review each approved wetland conservation plan every five years. After such review the director shall either modify, reissue or rescind the order approving the plan.

(7) In conducting the five-year review of an approved wetland conservation plan, the director shall provide notice and the opportunity for public comment and hearing on whether:

(a) There has been a substantial change in circumstances that would affect the wetland resources subject to the plan and would adversely affect the compliance of the plan with the standards in ORS 196.681;

(b) Changes have been made in applicable state law, state-wide land use planning goals, federal law or agency rules that require the plan to be changed; and

(c) In the director's evaluation, the plan as implemented over the preceding five years meets the goals established in the plan.

(8) Wetland conservation plans approved by the Director of the Division of State Lands pursuant to ORS 196.668 to 196.692 shall be deemed to comply with the requirements of any state-wide planning goals relating to wetlands, other than estuarine wetlands, for those areas, uses and activities which are regulated by the plan.

(9) An order by the director regarding approval, amendment or review of a wetland conservation plan shall be reviewable by the Land Use Board of Appeals as a land use decision of a state agency. For the purpose of such review, the director's order shall not become final until the local government adopts its wetland conservation plan or plan amendment. The Land Use Board of Appeals shall consolidate for review appeals of the director's order and the local government adoption. The Land Use Board of Appeals shall review such order for compliance with the requirements of ORS 196.668 to 196.692, 196.800, 196.810, 196.825, 196.830, 196.850 to 196.860, 196.885, 196.905, 197.015, 197.279, 215.213, 215.283, 215.418 and 227.350.

(10) Nothing in this section shall be construed to require a contested case proceeding regarding approval, amendment or review of a wetland conservation plan.

(11) Nothing in this section shall be construed to affect the evaluation of a permit application in areas that do not have a wetland conservation plan.

(12) Upon a finding by the director, after a public hearing, that an affected local government is not enforcing the comprehensive plan provisions or land use regulations set forth in the conditions of the order, as specified in ORS 196.681 (5), and that such lack of enforcement has resulted or would result in adverse impacts to wetlands, the director shall modify, suspend or revoke approval of the wetland conservation plan. [1989 c.837 §13]

196.685 [Formerly 541.620; renumbered 196.815 in 1989]

196.686 Acknowledged estuary management plans; review and approval; hearings; final order. (1) For the purposes of this section, an acknowledged estuary management plan includes the comprehensive plan and land use regulations adopted by cities and counties to satisfy the requirement of state-wide planning goals related to estuarine resources including shoreland portions of estuarine sites designated for development as those plans and regulations existed on January 1, 1989.

(2) Any city or county may submit an acknowledged estuary management plan for review and approval by the division pursuant to the provisions of this section. The plan shall be submitted with a written request for review.

(3) To allow timely and effective review of acknowledged estuary management plans, the division may limit acceptance for review to two plans but not more than one plan for a deep draft development estuary at any one time.

(4) With the consent of the city or county submitting an estuary management plan for review and approval, the division may extend any or all of the deadlines set forth in this section.

(5) Acknowledged estuary management plans shall be presumed to comply with requirements for approval of wetland conservation plans specified in ORS 196.681.

(6) Within 10 days of acceptance of a request for review, the division shall provide notice to affected state agencies, local governments, federal agencies and the public of receipt of the acknowledged estuary management plan and of the request for review and approval of the acknowledged estuary management plan as a wetland conservation plan.

(7) Within 30 days of acceptance of a request for review and upon provision of at least two weeks' notice, the division shall hold a public informational hearing on the proposed approval of the acknowledged estuary management plan as a wetland conservation plan.

(8) Within 60 days of acceptance of the request for review, the division shall conduct a preliminary review of the acknowledged estuary management plan. The division shall consult with the affected local government prior to finalizing the preliminary review.

(9) Except as provided in subsection (10) of this section, the director shall approve the acknowledged estuary management plan by order within 60 days of completion of the preliminary review.

(10) A contested case hearing shall be held within 30 days of the completion of the preliminary review or receipt of a request for hearing if:

(a) The director determines there is probable cause to believe that the estuary management plan does not meet the standards for approving wetland conservation plans or unreasonably interferes with the use of the estuary for navigation, fisheries or public recreation; or

(b) A hearing is requested and the request:

(A) Is made in writing within 60 days of the date of mailing of notice of completion of review;

(B) Clearly states the reasons for requesting the hearing; and

(C) Provides sufficient information for

the director to determine that there is probable cause to believe that the estuary management plan does not meet the standards for approving wetland conservation plans or unreasonably interferes with the use of the estuary for navigation, fisheries or public recreation.

(11) The director shall approve the acknowledged estuary management plan as a wetland conservation plan by order unless the director finds by a preponderance of the evidence that the estuary management plan does not meet the standards for approving wetland conservation plans or unreasonably interferes with the use of the estuary for navigation, fisheries or public recreation or that substantial fills proposed in an estuary management plan for nonwater dependent use are not for a public use and would not satisfy a public need that outweighs harm to navigation, fisheries or public recreation.

(12) The director shall prepare a proposed order for review by the parties within 30 days of any contested case hearing held pursuant to subsection (10) of this section.

(13) A final order from the director that recommends, pursuant to subsection (8) of this section, denial of an estuary management plan as a wetland conservation plan shall identify deficient elements and provisions of the acknowledged estuary management plan and what measures may be taken to correct those deficiencies.

(14) Individual permit applications shall be required for removal or fill, or both, in areas subject to an approved estuary management plan. Individual permit applications shall be reviewed in accordance with ORS 196.815, 196.825 (5) and (6), 196.830 and 196.835. In lieu of the substantive standards for permit issuance in ORS 196.815 (1) and 196.825 (1), (2) and (3), the division shall issue a permit if the removal or fill, or both, is determined by the director to be consistent with the estuary management plan or can be conditioned to be consistent with the plan. The division shall condition any such permit as necessary to insure that the project:

(a) Is designed or configured to minimize alterations to waters of the state;

(b) Is the minimum size necessary to reasonably provide for the proposed use;

(c) Is consistent with the resource capabilities of the area and the purposes of the management unit, unless this has been previously determined in the approved estuary management plan;

(d) Is designed to minimize impacts from implementing the project; and

(e) Has estuarine resource replacement measures for creation, restoration or enhancement that replaces impacted resources.

(15) Judicial review of an order granting or denying approval of an estuary management plan as provided in this section shall be as provided in ORS 183.470.

(16) Following approval by the director of an estuary management plan, the requirements of ORS 196.684 shall apply to the approved estuary management plan. [1989 c.837 §14]

196.688 Public information program. (1) The division shall develop a public information program to educate permit applicants and the general public about:

(a) Wetland functions and values.

(b) The status and trends of Oregon's wetlands.

(c) The State-wide Wetlands Inventory.

(d) Wetland regulation.

(2) Upon request, the division shall, within the limits of staffing ability, provide technical assistance to other state agencies and local governments and the public in identifying and delineating the boundaries of wetlands. [1989 c.837 §20]

196.690 [Formerly 541.622; renumbered 196.820 in 1989]

196.692 Rules. The division shall adopt rules to carry out the provisions of ORS 196.668 to 196.692, 196.800, 196.810, 196.825, 196.830, 196.850 to 196.860, 196.885, 196.905, 197.015, 197.279, 215.213, 215.283, 215.418 and 227.350. [1989 c.837 §32]

ATTACHMENT N-9

MOU FOR THE CONSERVATION OF WETLAND RESOURCES ASSOCIATED WITH HIGHWAY CONSTRUCTION PROJECTS IN MONTANA

INTERAGENCY MEMORANDUM OF UNDERSTANDING FOR THE CONSERVATION OF WETLAND RESOURCES ASSOCIATED WITH HIGHWAY CONSTRUCTION PROJECTS IN THE STATE OF MONTANA

MONTANA INTERAGENCY WETLANDS GROUP:

Montana Department of Transportation (MDT)
Montana Department of Fish, Wildlife & Parks (MDFWP)
Montana Department of Health & Environmental Sciences (MDHES)
Federal Highway Administration, Montana Division (FHWA)
Corps of Engineers, Montana Field Office (Corps)
Environmental Protection Agency, Montana Office (EPA)
U.S. Fish & Wildlife Service, Montana/Wyoming Office (USFWS)

HELENA, MONTANA
1992

I. Purpose.

The purpose of this Memorandum of Understanding is to establish guidelines for the identification and evaluation of wetland resources impacted by the need to maintain and improve transportation corridors in the State of Montana. In addition, with conservation as a goal, guidance is provided to identify appropriate and practicable steps to minimize impacts to valuable wetland resources and where possible, to enhance the environment.

The tenets of this Memorandum of Understanding are founded on the principles of the Montana Environmental Policy Act and the National Environmental Policy Act which recognize the right of every citizen to a clean and healthy environment, as well as the responsibility of government agencies to make wise and informed decisions when assessing the impacts of legitimate competing needs. Additionally, activities conducted in accordance with the guidance provided within will ensure compliance with the following:

- U.S. Department of Transportation Order 5660.1a
- Executive Order 11990, Protection of Wetlands
- Section 404, Water Quality Act of 1987 as implemented by:
  - 33 CFR 320-330: Corps Regulatory Program Rules
  - 40 CFR 230: Section 404(b)(1) Guidelines
- Section 401, Water Quality Act of 1987
- 23 CFR 777: Mitigation of Environmental Impacts to Privately Owned Wetlands
- Montana Water Quality Act

II. Goals

1. Establish a process to ensure the early involvement of concerned agencies in addressing wetland impacts due to highway construction.

2. Satisfy the requirements of applicable state and federal environmental regulations and directives pertaining to wetland resources.

3. Expedite highway project development by minimizing administrative delays and coordination requirements.

III. Objectives

The primary objectives clarified by this Memorandum of Understanding are to:

1. Categorize wetlands potentially impacted by highway projects as follows:

   a. Navigable and other waters of the U.S. (including wetlands) subject to Clean Water Act regulatory authority;

b. Wetlands exempted from Clean Water Act regulatory authority (e.g., drainage ditches cut in the upland and prior converted cropland), but subject to review under E.O. 11990;

c. Wetland habitat containing species designated on a state and/or federal level as threatened or endangered.

2. Assess the relative value of all resources impacted by potential alternatives and mitigation proposals associated with a construction project.

3. Assess the impact of wetland loss in perspective with the need to construct and maintain safe and efficient transportation corridors.

4. Avoid or minimize the loss and/or reduction in function/importance of wetlands due to highway construction impacts.

5. Obtain effective, high quality mitigation for unavoidable losses of wetlands by evaluating proposed highway projects and transportation corridors early in the planning process in accordance with the following:

RESOURCE CATEGORY	MINIMUM MITIGATION REQUIREMENTS
1.a. (Section 404)	That necessary to satisfy the requirements of the Clean Water Act regulatory authority.
1.b. (Federal Funding)	That necessary to satisfy the requirements of E.O. 11990.
1.c. (T&E Species)	That determined to be needed by the lead agency (e.g. Corps of Engineers or FHWA) to avoid making a "likely to adversely affect" determination (50 CFR Part 402, Interagency Cooperation-Endangered Species Act of 1973, as Ammended; Final Rule [Section 402.13 and 402.14], June 3,1986). In cases where a "may adversely affect" determination is necessary, formal consultation will be initiated with the U.S. Fish & Wildlife Service in conformance with Section 402.14.

IV. Guidelines

A. This Memorandum of Understanding is supplementary to all applicable State and Federal laws, regulations and guidelines, and is for the purpose of expediting implementation of such existing authority only. Participating agencies retain all legally established regulatory authorities and management responsibilities. However, for purposes of compliance with the Statutes and Administrative Orders referenced in Section I, participating agencies agree to abide by these procedures, subject to the provisions of Section V. herein.

B. This Memorandum of Understanding will function under the general guidance and oversight of the **Montana Interagency Wetlands Group**, which consists of the following signatory agencies:

Montana Department of Transportation (MDT)
Montana Department of Fish, Wildlife & Parks (MDFWP)
Montana Department of Health & Environmental Sciences (MDHES)
U.S. Department of Transportation Federal Highway Administration, Montana Division (FHWA)
U.S. Army Corps of Engineers, Montana Field Office (Corps)
U.S. Environmental Protection Agency, Montana Office (EPA)
U.S. Department of the Interior Fish & Wildlife Service, Montana/Wyoming Office (USFWS)

C. Each agency will designate one representative to the Group, and may also designate substitutes. The Group will be chaired by the representative from MDT.

D. This Memorandum of Understanding will apply to federally and state funded highway projects where the nature of construction would unavoidably adversely impact wetlands identified in Section III.1. above.

E. Upon identification of potential impacts to wetlands identified in Section III.1. associated with any project, the MDT Environmental & Hazardous Waste Bureau will contact the **Technical Subcommittee** in compliance with this Memorandum of Understanding. The Technical Subcommittee will be composed of one qualified resource specialist from each of the following Interagency Group members: MDT, MDFWP, and the Corps. The Subcommittee will be chaired by the representative from MDT. Additional ad hoc seats may be added to the Technical Subcommittee to accommodate the concerns of nonmember agencies that have project specific jurisdictional authority by law and similar wetland resource responsibility; or, to provide special expertise not found within the member agencies.

F. For purposes of this Memorandum of Understanding, the following definitions and terms will apply:

1. **"Mitigation"** - in accordance with 40 CFR 1508.20(a)-(e), and includes the following measures:

    a. Avoiding the impact altogether by not taking a certain action or parts of an action;

    b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;

    c. Rectifying the impact by repairing, rehabilitating or restoring the affected environment;

    d. Reducing or eliminating the impact over time by preservation and maintenance operations during the lifetime of the action; (Preservation of existing wetlands resources may only in exceptional circumstances be accepted as compensatory mitigation. Preservation of existing wetlands not impacted by a highway project is not, generally of itself, acceptable mitigation for the loss of wetlands functions and values stemming from highway construction.)

    e. Compensating for the impact by replacing or providing substitute resources or environments.

2. **"Waters of the United States"** - incorporated by reference from 33 CFR 328.3(a)(1)-(7);

3. **"Wetland"** - definitions contained in the following documents will be used as applicable, and are hereby incorporated by reference:

    a. Resource category 1.a. (Section 404) - 33 CFR 328.3(b), and 40 CFR 230.3;
    b. Resource category 1.b. (Federal Funding) - Executive Order 11990.

4. **"Wetland delineation"** - refers to the process of identifying the boundary of a jurisdictional wetland and will be accomplished by application of the procedures currently in use by the Corps at the time of the study.

V. Wetland Inventory and Assessment

As early as possible in the planning and design development process for highway projects, or for highway transportation corridors if feasible, the MDT Environmental & Hazardous Waste

Bureau will identify wetland resources that may be impacted and contact the Technical Subcommittee if resources listed in Section III.1. are present. The Subcommittee will determine the extent, functions and values of all wetlands potentially impacted, and recommend alternatives and mitigation options consistent with this Memorandum of Understanding, appropriate to the scope, purpose and need of the highway construction project. The impacts on all environmental resources, including existing wetlands, of each alternative and mitigation plan will be assessed in conformance with this Memorandum of Understanding and all other environmental laws and regulations. The Subcommittee will utilize expertise and assistance from local or regional resource specialists or other sources as the need arises.

If agreement cannot be reached by the Subcommittee on any issue related to this Memorandum of Understanding, the matter will be referred to the entire Interagency Group. Failure to respond (without extenuating cause) by any agency representative will be interpreted as agreement with the decision reached by the remainder of the Group. Such non-responding agency will not object at a later date after a final decision on an issue has been reached. Final determination of any issue based on legal requirements will rest solely on the legally defined lead agency.

The Subcommittee will ensure that a **Project Wetland Resource Inventory/Impact Assessment** is written for each project involving wetland resource impacts, to be used in the development of the project design and required environmental documents, including a **Wetland Finding**. The Subcommittee will include a determination of the specific geographic areas of wetland resource sites impacted by the project and recommendations for mitigation alternatives, including avoidance and minimization. The Subcommitee will further include documentation that demonstrates that the appropriate wetland mitigation sequence analysis (i.e., avoidance, minimization, compensation) has been followed in the project alternatives analysis. The **Project Wetland Resource Inventory/Impact Assessment** will be made a part of the official record on the project and will be available to any member of the Interagency Group upon request.

After mitigation projects are completed, they will be reviewed by the Subcommittee. The Subcommittee will advise the MDT when the mitigation project is satisfactorily completed and, if requested, submit an acceptance report to any member of the Interagency Group.

Agreement/concurrence on wetland resource assessment and mitigation proposals will be by written correspondence between the Subcommittee members or by citing personal communications. A copy of pertinent letters and/or personal communication records will be maintained in the **Wetland Resource Ledger/Mitigation Balance Record** document.

VI. Mitigation Procedures and Accounting

The objectives of mitigation are to avoid, minimize or replace losses of wetland resources due to highway construction. Avoiding and minimizing wetland impacts by design and construction measures will be the first priority mitigation objective. For remaining unavoidable impacts, mitigation plans will be developed in accordance with the general guidance provided in Section III.5. above, and in accordance with all other applicable local, state and federal environmental laws and regulations (see Attachment A).

A wetlands mitigation summary balance sheet for each project will be maintained by MDT as part of the **Wetland Resource Ledger/Mitigation Balance Record.** This balance sheet will be reviewed at least annually by the Montana Interagency Wetlands Group. The overall mitigation objective is no net loss of wetlands functions, values and area on an annual basis. However, it is recognized that due to project development constraints and the lack of suitable sites for effective wetland development identifiable by the Technical Subcommittee, negative or positive balances may accrue and be carried forward from year-to-year. Balances carried forward will apply to the succeeding year's mitigation and will be directed toward wetland replacement within a similar biotic region or geographical area, as determined appropriate by the Interagency Group.

VII. Duration

This Memorandum of Understanding shall remain in force from the date of final signing, subject to review and amendment, upon the approval of the participating agencies. This Memorandum of Understanding may be rescinded by mutual agreement of participating agencies at any time or revoked by any party alone upon 30 days written notification to the other participants.

VIII. Signatories

Signatory agencies to this Memorandum of Understanding follow on Page 7.

MONTANA INTERAGENCY WETLANDS GROUP:

SIGNED

Hank Honeywell

Hank Honeywell, Division Administrator
Federal Highway Administration

SIGNED

John F. Wardell

John F. Wardell, Director
Montana Office U.S. Environmental Protection Office

SIGNED

Kemper M. McMaster

Kemper M. McMaster, Field Supervisor
Montana/Wyoming, U.S. Fish & Wildlife Service

SIGNED

K. L. Cool

K. L. Cool, Director
Montana Department of Fish, Wildlife & Parks

SIGNED

Dennis Iverson

Dennis Iverson, Director
Department of Health & Environmental Sciences

SIGNED

Robert McInerney, Montana State Supervisor
Ohamha District - Corps of Engineers

SIGNED

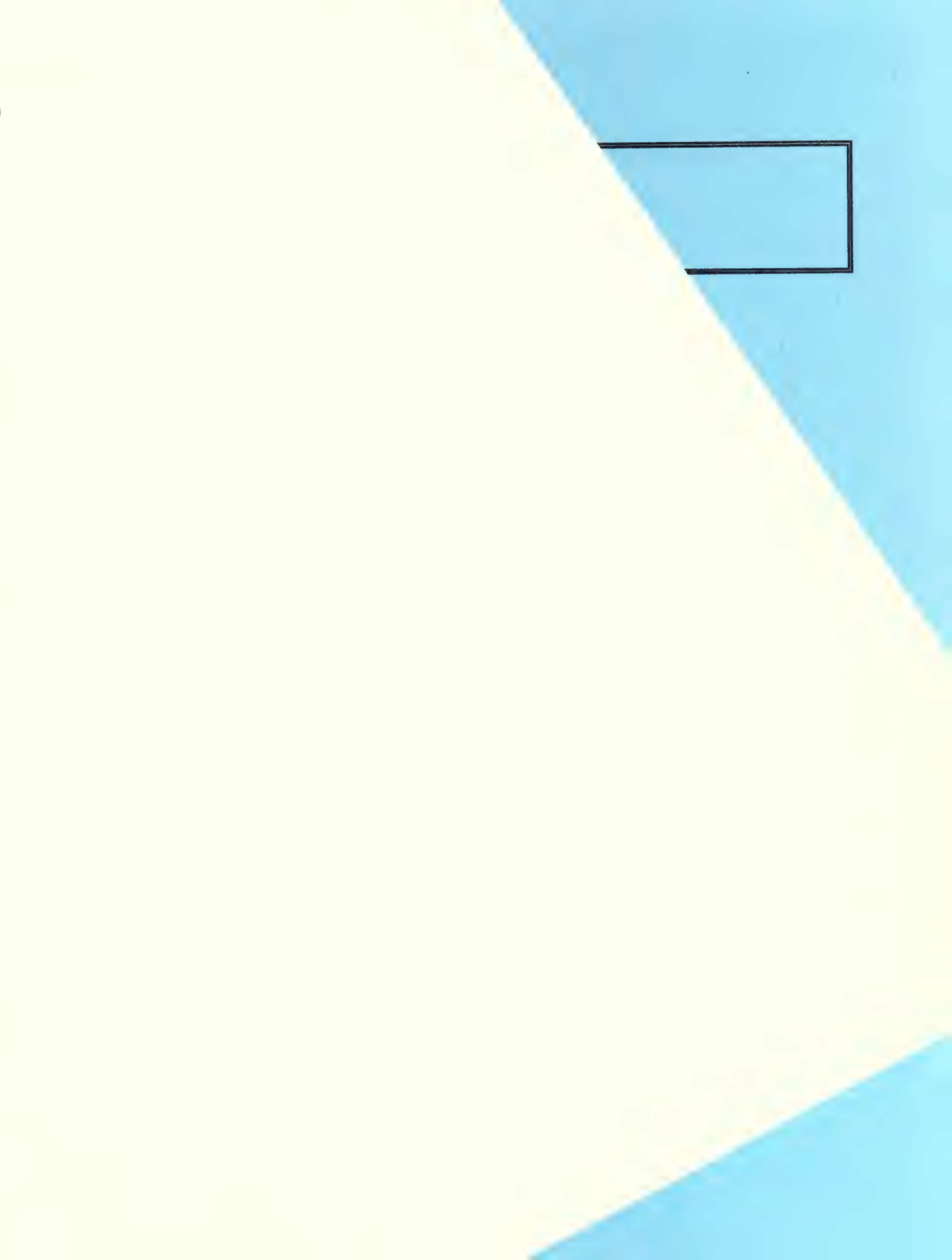
John Rothwell

John Rothwell, Director
Department of Transportation

Attachment A (VI. Mitigation Procedures and Accounting, Page 5)
Montana Interagency Wetlands Group
Memorandum of Understanding

ENVIRONMENTAL LAWS AND REGULATIONS

Antiquities Act
Antiquities and Archaeological Resource Protection Act
Aquatic Lands Conservation (Confederated Salish-Kootenai) Ordinances 64A & 87A
Archaeological and Historic Preservation Act
Bald Eagle Protection Act ✓
Blackfeet (Water) Permit W101D
Civil Rights Act - Title VI
Clean Air Act (as ammended)
Clean Water Act (Sections 401 and 404)
Comprehensive Environmental Response, Compensation & Liability Act ("CERCLA")
Department of Transportation Act ["Section 4(f)" and 23 CFR 771 regulations]
Emergency Wetlands Resources Act
Endangered Species Act
Executive Order 11514
Executive Order 11593
Executive Order 11988 (Floodplains)
Executive Order 11990 (Wetlands)
Executive Order 11991
Executive Order 12185
Farmland Protection Policy Act
Fish and Wildlife Coordination Act
Hazardous and Solid Waste Amendments (to "NEPA")
Migratory Bird Act
Montana Environmental Policy Act ("MEPA" - Title 75, Chapter 1 of the MCA)
Montana Human Skeletal Remains and Burial Site Protection Act
Montana Stream Protection Act ("MSPA")
Montana Water Quality Act
Montana Wellhead Protection Act
National Environmental Policy Act ("NEPA")
National Flood Insurance Act
National Historic Preservation Act ("NHPA/Section 106")
National Land and Water Conservation Fund Act ["Section 6(f)"]
National Trails System Act
Native American Religious Freedom Act
North American Wetlands Conservation Act
President's Council on Environmental Quality (CEQ) Regulations (40 CFR 1500)
Resource Conservation and Recovery Act ("RCRA")
Safe Drinking Water Act ("sole-source aquifer")
Superfund Amendments (to "CERCLA") and Reauthorization Act
Surface Transportation and Uniform Relocation and Assistance Act ("STURA")
Water Bank Act
Wild and Scenic Rivers Act
Wilderness Act



Attachment O

SCS WETLAND DETERMINATION PROCEDURES

WEST
NATIONAL
TECHNICAL
CENTER

TECHNICAL NOTE

Subject: BIOLOGY

Series No.: TECHNICAL NOTE W-3

Reference: WETLAND MAPPING CONVENTIONS FOR FOOD SECURITY ACT (FSA) WETLAND INVENTORIES

Date: DECEMBER 1988

DIST:
S-West
T
N-ECS

SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

WETLAND MAPPING CONVENTIONS
FOR 1985 FOOD SECURITY ACT (FSA)

INTRODUCTION

This document outlines the procedures and methods the SCS will use to conduct an FSA wetland inventory. These procedures and methods (conventions) are not intended to state or document service policy. They are designed to ensure mapping consistency between field offices. These conventions are a result of the Wetlands Inventory and Mapping Workshop held in Portland, and derive from the Midwest NTC Technical Note No. 190-LI-8 as modified by the participants. Conventions will conform to the FSA definitions and meet the basic wetland criteria. (See FSA Manual - July 1988). The criteria for mapping conventions of wetlands considers landscape, soils, flooding frequency, vegetation, etc.

GENERAL INFORMATION

1. Size of an area is not part of the wetland criteria. However, areas large enough to be detected when interpreting aerial photography will be mapped.

2. At any step in the process that the reviewing person or mapping team is satisfied that the area in question either is or is not a wetland, further evaluation is unnecessary. Decisions and the supporting material used will be documented in each step of these guidelines. Frequent field checking should be done until the reviewing person or mapping team has become proficient at photo interpretation in each mapping location.

3. Maps developed from these conventions will be used as the primary basis for completing wetland determinations in accordance with established FSA definitions and policy. Final determination decisions are the responsibility of the district conservationist. Field determination of hydric soils and hydrophytic vegetation may still be needed.

[illegible] no.
72-[illegible]

Wetlands will be inventoried using the following procedure. The process takes into consideration both above normal and below normal precipitation years. The principle tools used to make the wetland determination are: soil survey, USGS quads, weather data, NWI maps, ASCS color slides, and black and white aerial photos. Generalized maps developed in consultation with Corps of Engineers, USFS, state agencies, etc., showing flooded or flood prone areas may be used. Source documentation is required in the case file.

TERMINOLOGY

Wetland areas that are seasonally flooded or ponded that have been manipulated prior to December 23, 1985, to produce an agricultural commodity but otherwise continue to meet wetland criteria shall be mapped as a farmed wetland "FW" as defined below.

- **CROPLAND.** --Surface water must be present on cultivated fields for extended periods in the growing season to qualify as seasonally flooded or ponded for farmed wetland "FW", or wetland "W". Extended periods occur if surface water is continually present for 15 consecutive days or more of the growing season under average conditions (50 percent chance of occurrence). Growing season for wetland plants in the West is defined in Hydric Soils of the United States.

Review NWI maps where available. NWI maps will give an overview of the wetlands in the area. All wetlands on the NWI maps will be considered wetlands for these conventions unless review of the ASCS slides or local information fails to confirm the area as meeting wetland criteria. This could happen for the following reasons:

1. Review of the slides does not show basins as having water, hdyrophytic vegetation, drowned out crops, or different crop colors during abnormally dry or wet years.

2. The wetland has been drained since the NWI photos were taken. Look for manipulation such as ditches, new tile lines, dikes or levees.

NOTE: Many wetlands are excluded on NWI maps because of the Fish and Wildlife Service's Farmed Wetland Policy. The SCS state office may wish to contact the FWS regional wetland coordinator to get an overview of the NWI mapping conventions.

Review other available ASCS or SCS photographs; such as, 4"=1 mile black and white or colored infrared photographs.

Review ASCS color slides (and color infrared if available) for the years 1980 to 1988 (when available). In most cases, 5-7 years will be available in most counties. Use Geological Survey or weather service climatological data in conjunction with the ASCS slides. Review the climatological data to determine those years which were above or below normal precipitation 2 to 3 months prior to the date of the slide. Most slides were taken in late June or July. In most cases, flights were flown in July.

When reviewing slides, the following criteria are considered indicators of a wetland and will be marked.

1. Hydrophytic vegetation in the area.

2. Water or drowned out crop (mud flat).

3. Stressed crop production due to wetness (yellow).

4. Color of crop in dry or wet years (greener or yellow).

5. Differences in color due to different planting dates.

When viewing the slides, place a clear overlay on the Kodak caramate screen. Circle the wetland with a dry erasable marker for the first year (view wettest year first) reviewed. Go to the next year slide, circle new wetlands, and place a checkmark by those wetlands that have reoccured. Repeat the process for all the years. The clear overlay is a good way to begin the process. After using the conventions for a period of time, experience may allow the clear overlay to be dropped from the process. Always check for manipulation of the wetlands. Document manipulations! (See exhibit - Wetness History . . . -as an example of documentation.)

X = An X is used when team member has a question on a call. District conservationist needs to make the decision. Not used often.

NOTE: Artificial wetlands "AW" may be difficult to determine with this process. Farmer information or an onsite visit may be necessary.

The distict conservationist will review the wetlands inventory and any other pertinent information available. A field trip will be taken when necessary to check questionable wetlands. The appropriate FSA wetlands determination will be documented on the official ASCS map (photo) and SCS-CPA-026. Pertinent supporting data will be added to the case file. **Scope and effect of the existing drainage on farmed wetlands "FW" will be documented in the case file.**

APPENDIX
HYDRIC SOILS CRITERIA

1. All Histosols except Folists.

2. Soil in Aquic suborders, Aquic subgroups, Albolls suborder, Salorthids great group, or Pell great groups of Vertisols that are:

   a. Somewhat poorly drained and have a water table less than 0.5 feet from the surface for a significant period (usually a week or more) during the growing season, or

   b. Poorly drained or very poorly drained and have either:

      (1) Water table less than 1.0 feet from the surface for a significant period (usually a week or more) during the growing season if permeability is equal to or greater than 6.0 inches/hour in any layer within 20 inches, or

      (2) A water table at less than 1.5 feet from the surface for a significant period (usually a week or more) during the growing season if permeability is less than 6.0 inches/hour in any layer within 20 inches.

3. Soil that are ponded for long (7 days to 1 month) or very long (longer than 1 month) duration during the growing season.

4. Soils that are frequently flooded or long (7 days to 1 month) or very long (longer than 1 month) duration during the growing season.

WETLAND PLANT INDICATOR GROUPS

Indicator Group	% of Time it Occurs in Wetland	Ecological Index
obligate (obl)	> 99	1
facultative wet (facw)	67-99	2
facultative (fac)	34-66	3
facultative upland (facu)	1-33	4
upland (upl)	<1 and all plants not on the NLPSOW*	5

A prevalence value of ≥ 3 is not wetland, <3 is wetland.

*National List of Plant Species that Occur in Wetlands.

GUIDELINES FOR WETLAND DELINEATIONS

CROPLAND 15 DAYS FLOODED OR PONDED

1. yes or no - Hydric soil - Flooded or Ponded Map
2. yes or no - Hydric soil
3. yes or no - Does wetland show up on NWI?
4. 0 = Circle wetland first year observed
5. ✓ = Checkmark for each subsequent year observed
6. Outline boundaries of wetland and enter symbol (see X below).

EXAMPLE: Five (5) or more years of ASCS slides

#	FLOODED OR PONDED		NWI	B & W	ASCS SLIDES 81-88	STATUS
	STATE MAP	LOCAL RECORDS				
1	Yes	Yes	No	No	0 or X	Possible-Check weather records
	No	No	No	No	0	None
2	Yes	No	No	Yes	0 ✓	Probable-Check weather records
	Yes	Yes	Yes	Yes	0 ✓	Wetland
3	Yes	Yes	Yes or No	Yes or No	0 ✓ or ✓ more ✓	Wetland

X = An X is used when team member has a question on a call. District conservationist needs to make decision. Not used often.

GUIDELINES FOR WETLAND DELINEATIONS

WOODY COVER OR ABANDONED CROPLAND - 7 DAYS FLOODED OR PONDED

1. yes or no - Hydric soil - Flooded or Ponded Map
2. yes or no - Hydric soil
3. yes or no - Does wetland show up on NWI?
4. 0 = Circle wetland first year observed
5. ✓ = Checkmark for each subsequent year observed
6. Outline boundaries of wetland and enter symbol

EXAMPLE: Five (5) or more years of ASCS slides

	FLOODED OR PONDED				ASCS	
#	STATE MAP	LOCAL RECORDS	NWI	8"-mi B & W	SLIDES 81-88	STATUS
1	Yes	Yes	No	No	0 or X	Possible-Check weather records
	No	No	No	No	0	None
2	Yes	No	No	Yes	0 ✓	Probable-Check weather records
	Yes	Yes	Yes	Yes	0 ✓	Wetland
3	Yes	Yes	Yes or No	Yes or No	0 ✓ or ✓ more ✓	Wetland

X = An X is used when team member has a question on a call. District conservationist needs to make decision. Not used often.

FSA WETLAND MAP SYMBOLS

W - Wetland

Wetlands are defined as areas that have a predominance of hydric soils and that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions except lands in Alaska identified as having a high potential for agricultural development and a predominance of permafrost soils.

FW - Farmed Wetland

Farmed wetlands are certain wetlands that were manipulated and used to produce an agricultural commodity prior to December 23, 1985, but had not been completely converted prior to that date and therefore are not prior converted cropland. These areas still meet the wetland criteria and include potholes and playas or areas that are seasonally ponded or flooded for an extended period of time. These areas can be farmed and drainage systems maintained as they were prior to December 23, 1985.

PC - Prior Converted Cropland

Prior converted cropland can be either a pothole or a ponded or flooded area that was completely drained and no loger meets wetland criteria (see NFSAM 512.15); or a saturated hydric soil that was hydrologically manipulated or cleared of trees and stumps and planted to an agricultural commodity produced prior to the FSA, December 23, 1985, and not abandoned.

CW-- Converted Wetlands

Wetlands that are converted after December 23, 1985, and not subject to one or more exemptions cannot be used to produce an agricultural commodity without causing a person to lose eligibility for USDA benefits. "Converted Wetland" means wetland that has been drained, dredged, filled, leveled, or otherwise manipulated (including any activity that results in impairing or reducing the flow, circulation, or reach of water) that makes possible the production of an agricultural commodity without further application of the manipulations described herein if (1) such production would not have been possible but for such action; (2) before such action such land was neither highly erodible land nor highly erodible cropland; and (3) is not abandoned.

AW - Artificial Wetlands

An area is an artificial wetland if the area was formerly nonwetland or prior converted wetland but now exhibits wetland characteristics because of human activities, i.e., dugouts, ponds, dams, irrigation, etc.

FWS - NATIONAL WETLAND INVENTORY - CONDENSED MAP LEGEND

System and Subsystem

P - Palustrine	No Subsystem
R - Riverine	1 - Tidal 2 - Lower perennial 3 - Upper perennial 4 - Intermittent
L - Lacustrine	1 - Limnetic (deep) 2 - Littoral (shallow)

Class

Em - Emergent
SS - Scrub/Shrub
FO - Forested
AB - Aquatic Bed
ML - Moss/Lichen
US - Unconsolidated Shore
RB - Rock Bottom
UB - Unconsolidated Bottom
OW - Open Water

Water Regime Modifiers

A - Temporarily flooded
B - Saturated
C - Seasonally flooded
F - Semipermanently flooded
G - Intermittently exposed
H - Permanently flooded
J - Intermittently flooded

Special Modifiers

b - Beaver
d - Partially Drained/Ditched
f - Farmed
h - Diked/Impounded
r - Artificial
s - Spoil
x - Excavated

Examples: PEMA P - Palustrine; EM - emergent; A - Temporarily flooded.

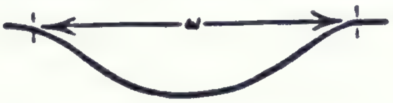
PEMCd P - Palustrine; EM - emergent; C - seasonally flooded; d - partially drained/ditched

L2ABF L - Lacustrine; 2 - Littoral; AB - aquatic bed; F - semipermanently flooded.

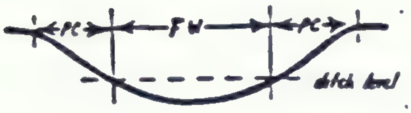
ILLUSTRATIONS

POTHOLES & PONDED WETLANDS

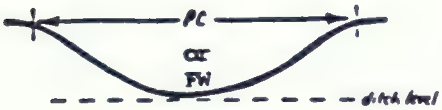
No Ditch



Ditch installed
prior to 12/23/85

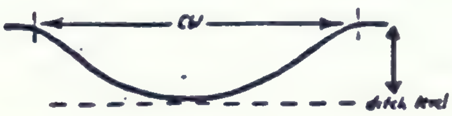


Ditch installed
prior to 12/23/85

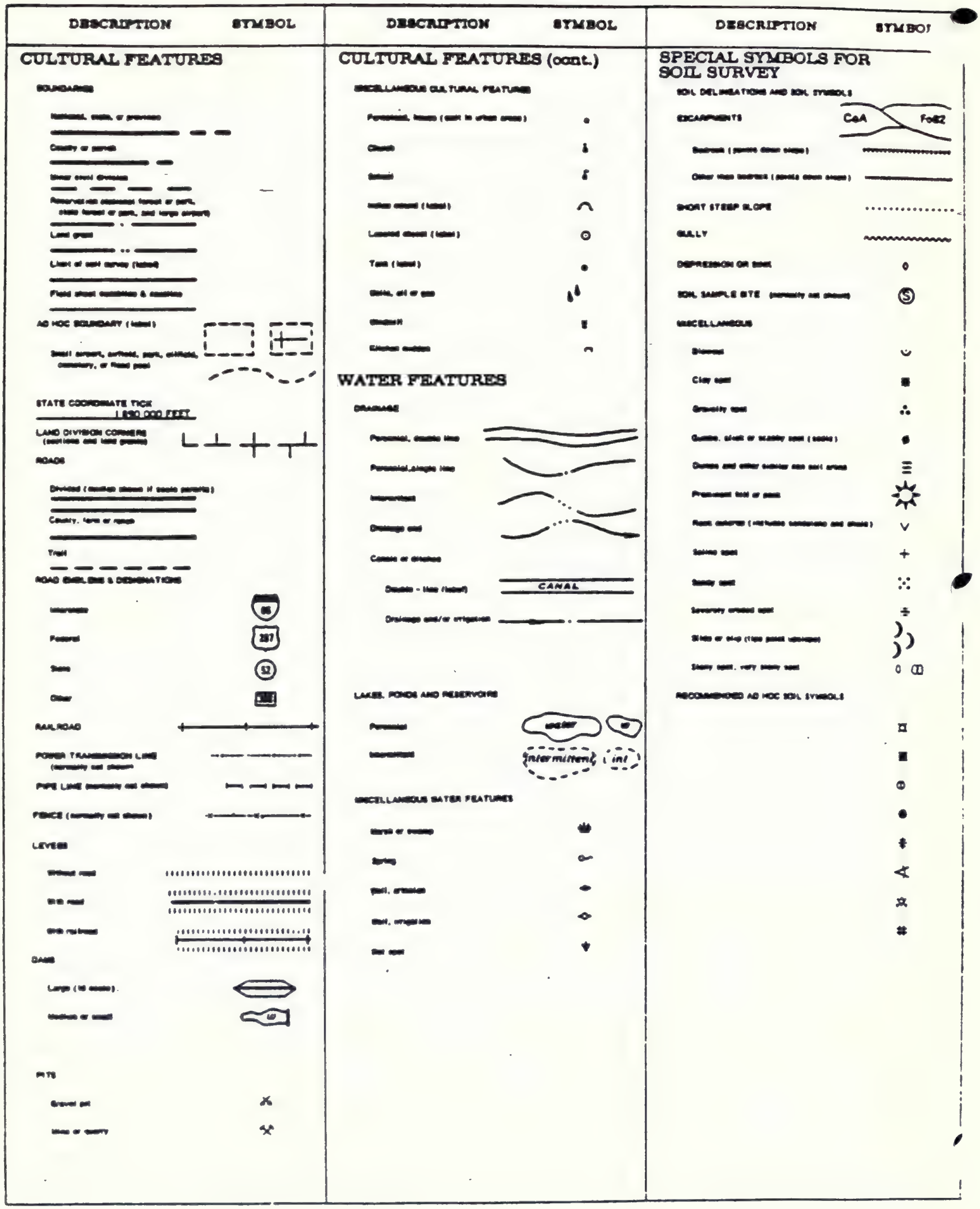


Note: Before potholes can become PC, they must no longer meet wetland criteria--soils and plants.

Ditch installed
since 12/23/85
AT ANY LEVEL



CONVENTIONAL AND SPECIAL SYMBOLS LEGEND



DESCRIPTION	SYMBOL
CULTURAL FEATURES	
BOUNDARIES	
National, state, or province	
County or parish	
Minor civil division	
Reservation (national forest or park, state forest or park, and large airport)	
Land grant	
Limit of soil survey (label)	
Field sheet matchline & neatline	
AD HOC BOUNDARY (label)	
Small airport, airfield, park, oilfield, cemetery, or flood pool	
STATE COORDINATE TICK 1 890 000 FEET	
LAND DIVISION CORNERS (sections and land grants)	└ ┴ ┼ ┬┴
ROADS	
Divided (median shown if scale permits)	
County, farm or ranch	
Trail	
ROAD EMBLEMS & DESIGNATIONS	
Interstate	85
Federal	287
State	52
Other	
RAILROAD	
POWER TRANSMISSION LINE (normally not shown)	
PIPE LINE (normally not shown)	
FENCE (normally not shown)	
LEVEES	
Without road	
With road	
With railroad	
DAMS	
Large (to scale)	
Medium or small	
PITS	
Gravel pit	⚒
Mine or quarry	⚒

DESCRIPTION	SYMBOL
CULTURAL FEATURES (cont.)	
MISCELLANEOUS CULTURAL FEATURES	
Farmstead, house (omit in urban areas)	•
Church	
School	
Indian mound (label)	∩
Located object (label)	⊙
Tank (label)	•
Wells, oil or gas	
Windmill	
Kitchen midden	
WATER FEATURES	
DRAINAGE	
Perennial, double line	
Perennial, single line	
Intermittent	
Drainage end	
Canals or ditches	
Double - line (label)	CANAL
Drainage and/or irrigation	
LAKES, PONDS AND RESERVOIRS	
Perennial	water w
Intermittent	intermittent int
MISCELLANEOUS WATER FEATURES	
Marsh or swamp	
Spring	
Well, artesian	
Well, irrigation	
Wet spot	

DESCRIPTION	SYMBOL
SPECIAL SYMBOLS FOR SOIL SURVEY	
SOIL DELINEATIONS AND SOIL SYMBOLS	CaA FoE2
ESCARPMENTS	
Bedrock (points down slope)	
Other than bedrock (points down slope)	
SHORT STEEP SLOPE	....
GULLY	〰〰〰
DEPRESSION OR SINK	◊
SOIL SAMPLE SITE (normally not shown)	Ⓢ
MISCELLANEOUS	
Blowout	◡
Clay spot	■
Gravelly spot	∴
Gumbo, slick or scabby spot (sodic)	●
Dumps and other similar non soil areas	≡
Prominent hill or peak	☼
Rock outcrop (includes sandstone and shale)	V
Saline spot	+
Sandy spot	⁙
Severely eroded spot	÷
Slide or slip (tips point upslope)	)))
Stony spot, very stony spot	0 00
RECOMMENDED AD HOC SOIL SYMBOLS	⌑
	■
	⊖
	●
	‡
	∢
	☆
	⌘

Wetness History for Tract __________ Field __________

Area	Soil	NWI	ASCS 35 mm slides								Remarks	Deter-mination
			1980	1981	1982	1983	1984	1985	1986	1987		
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

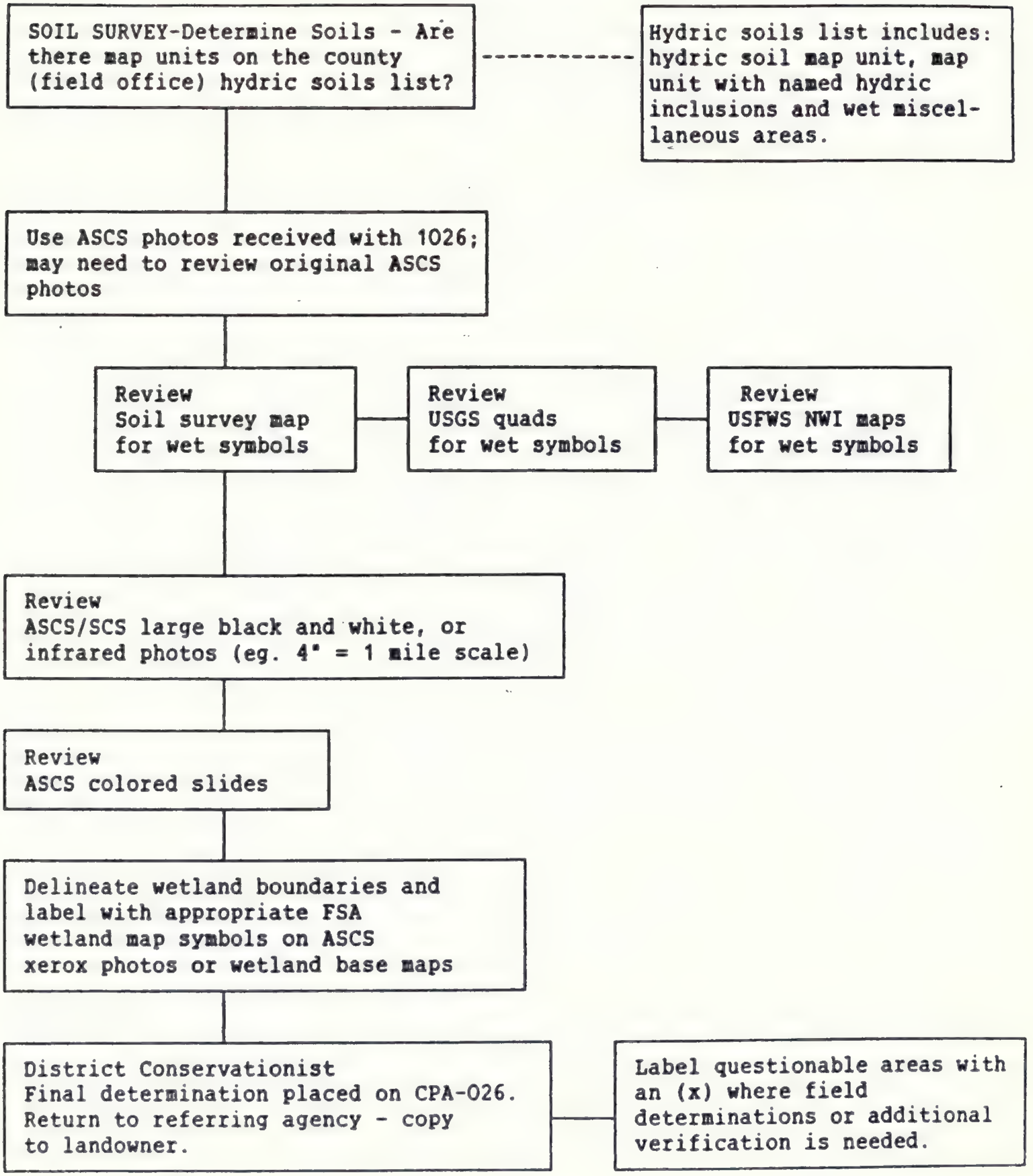
WETLAND HISTORY

+ - supports wetland criteria
- - does not support wetland criteria

OTHER NOTATIONS - use as needed to explain wetland history

d - ditched
pf - plow furrow
P - pasture
H - hayed
F - fallow
w - appears as wetland
c - cropped
do - drown out
ow - open water
m - mud flat
weeds

WETLAND DETERMINATION PROCEDURES AID #1
FLOW CHART*



SOIL SURVEY-Determine Soils - Are there map units on the county (field office) hydric soils list?

Hydric soils list includes: hydric soil map unit, map unit with named hydric inclusions and wet miscellaneous areas.

Use ASCS photos received with 1026; may need to review original ASCS photos

Review Soil survey map for wet symbols

Review USGS quads for wet symbols

Review USFWS NWI maps for wet symbols

Review ASCS/SCS large black and white, or infrared photos (eg. 4" = 1 mile scale)

Review ASCS colored slides

Delineate wetland boundaries and label with appropriate FSA wetland map symbols on ASCS xerox photos or wetland base maps

District Conservationist Final determination placed on CPA-026. Return to referring agency - copy to landowner.

Label questionable areas with an (x) where field determinations or additional verification is needed.

---

*Experience over time will normally reveal that some individual sources are more helpful or accurate than others; in which case this flow chart should evolve at each location to facilitate the use of those sources first.

FSA WETLAND DETERMINATION AID #2

Does the site have hydric soil, and/or hydric inclusions, and/or indication of a wet area	No->	FSA not applicable
Yes ↓		
Will the site, under natural conditions, support a prevalence of hydrophytes?	No->	FSA not applicable
Yes ↓		
Was the site hydrologically altered or otherwise manipulated or woody vegetation removed after 12/23/85	Yes->	CONVERTED WETLAND (CW) (Noncompliance only if planted to an agricultural commodity)
No ↓		
Was the site hydrologically altered or otherwise manipulated or woody vegetation removed prior to 12/23/85?	No->	WETLAND (W) (Does aritificial wetland (AW) exemption apply?)
Yes ↓		
Was an agricultural commodity planted at least 1 year prior to 12/23/85	No->	WETLAND (W) (Does "AW" exemption apply?)
Yes ↓		
Has the area been abandoned?	Yes->	WETLAND (W) (Does "AW" exemption apply?)
↓ No		
Is the area a pothole or playa?	Yes->	FARMED WETLAND (FW) (Does "AW" exemption apply?)
↓ No		
Does the site flood or pond for more than 10% of the growing season or 15 consecutive days (whichever is less) during the growing season?	Yes->	FARMED WETLAND (FW) (Does "AW" exemption apply?) Do not use for conversions to permanent pasture (CW)
↓ No ↓		
PRIOR CONVERTED CROPLAND (PC)		

Note: "MW" exemption may apply for some "CW" determinations.

INVESTIGATION TECHNIQUES

Information Needed	Possible Sources
Hydric Soil	1) County list 2) Soil survey - map unit descriptions, wet symbols, streams, springs, etc. 3) USGS quads 4) Climatological data *5) Landowner interview *6) Site investigation *7) Take a soil scientist onsite 8) flooding maps or inventories
Prevalence of hydrophytes	1) NWI 2) ASCS color slides 3) SCS black and white or color photos 4) Soil survey vegetative info. map unit description tables *5) Site investigation - including similar non-cropped areas
Altered or Manipulated?	1) NWI 2) ASCS color slides - pre & post 85' if possible 3) SCS photos 4) USGS Quads *5) Case file *6) Site investigation including landowner interview *7) Other employee interview *8) Landowner interview
Planted prior 12/23/85	1) ASCS records and slides prior to 12/23/85 *2) Case file 3) Photo interpret 4) Employee knowledge 5) Landowner interview
Abandoned?	*1) ASCS records and slides for the past 5 years 2) SCS photos *3) Case file *4) Owner interview *5) On-site inspection 6) USGS quads

Pothole or Playa?	1) NWI maps 2) Soil suvey maps and map unit description 3) USGS quads 4) ASCS slides 5) SCS photos *6) Site investigation *7) Field office knowledge
Flooding or Ponding Duration	*1) Soils 5 *2) NWI *3) Field inspection *4) Landowner interview *5) Case file *6) Flood hazard study *7) Watershed investigations 8) Climatological data *9) Flooded crops, stressed crops long term use as forage rather than cropland, always plant spring crops?

* Sources which team mappers may not have available and may require field office assistance.

United States
Department of
Agriculture

Soil
Conservation
Service

Room 124
3244 Elder Stre
Boise, Idaho 83

June 2, 1988

NATIONAL FOOD SECURITY ACT MANUAL (NFSAM)
180-V
AMENDMENT ID-3

SUBJECT: LTP - Wetland Office Determination Procedure and Related Forms.

Purpose. To distribute wetland office determination procedures and related worksheets which will be used by field offices in documenting wetland activities.

Effective date. Upon receipt.

Filing Instructions.

1. File the Procedure in Section 510.50, page 510-26(a) to 510-26(c).

2. File the worksheets in the Exhibit Section as Exhibit 516.14, 516.15, and 516.16. Make pen and ink changes in the Table of Contents.

3. File the amendment immediately behind the Manual cover, ahead of the Table of Contents.

Paul H. Calverley

PAUL H. CALVERLEY
State Conservationist

Attachment

DIST: NFSAM

§510.50 Office Procedure for Making Wetland Determinations

The procedure for wetland office determinations throughout the State has not been consistent among Areas. To clear up misunderstandings and to maintain consistency between field offices, the attached office determination procedure will be followed.

As noted in the procedure, ASCS aerial slides are the backbone of the process. If 5 years of aerial slides (1981-'85) are not available, you are to use the resources (slides) available in your field office. All field offices should have at a minimum 1985-87 ASCS slides available for our use.

Three worksheets (Exhibits 516.14, 516.15 and 516.16), have been developed to assist field offices in documentation of wetland activities.

1. SUMMARY OF USE, MAINTENANCE AND IMPROVEMENTS OF VARIOUS WETLAND CONDITIONS (Exhibit 516.15). This worksheet will be used when any wetland determination is made. The producer will receive a copy to help them understand their responsibilities under Swampbuster.

2. NOTICE OF NO WETLAND DETERMINATION - ID-CPA(FSA)-22, revised 5/88 (Exhibit 516.14). As stated in the final FSA Manual, wetland determinations will be made on all 1026's within the established priority system.

   The revised form ID-CPA(FSA)-22 (Exhibit 516.14), will be used when a wetland determination is not made for an 1026. In this case, all producers who have hydric soils and/or soils with hydric inclusions will receive this form. Wetland determinations will continue to be made on all FmHA borrower and inventory farms and when blocks 7 or 8 are checked yes on the 1026 as in the past.

   If wetland determinations are not made when the 1026 and 026 forms are processed, a list should be developed which identifies producers who have wetland determinations to be completed in the future.

   The remarks block on the 026 form should refer landowner to the ID-CPA-22 and that a wetland determination was not made.

3. WETLAND INFORMATION WORKSHEET (Exhibit 516.16). This worksheet will be used by field offices to document past and present drainage activities (if any) on all wetland determinations. This worksheet by itself, does not constitute a prior conversion (PC). A statement would need to be added that the wetland area besides being manipulated, does not seasonally flood or pond and is not a playa or pothole to be considered PC.

   The landowner should receive a copy of the worksheet when completed.

This procedure will lead you through a step-by-step method of making wetland 1/ determinations for the Food Security Act in the office. If a wetland determination is not made, then ID-CPA(FSA)-22, revised 5/88, will be used to document potential for wetlands and that no determination was made. See Exhibit 516.14. The process of making wetland determinations in the office will require the following resources:

1. Soil Survey.

2. Fish and Wildlife National Wetland Inventory Map (MWI), where available.

3. ASCS aerial slides (preferably 5 years -- 1981-1985).

Step 1: Review soil survey. Identify the following soils:

1. Named hydric map units.

2. Map units with hydric soils as inclusions.

3. Map units with no hydric soils. In most cases, these can be eliminated from further review. However, these soils may have artificial wetlands (AW) or other oddities which need to be identified.

The review of the soil survey will provide information on which areas have a potential for wetlands.

Step 2: Review FWS NWI maps where available. NWI maps will give an excellent overview of the wetlands in the area. All wetlands on the NWI maps will be considered wetlands for FSA unless review of the ASCS slides does not confirm wetland. This could happen for the following reasons:

1. Review of the slides does not show basins as having water, hydrophytic vegetation, and drowned-out crops.

2. Wetland has been drained since the NWI photos were taken in 1979.

Step 3: Review ASCS aerial slides. 5 years of slides should be looked at preferabley 1981-85. Most ASCS slides are taken in June or July. You should keep in mind those years where above or below precipitation when viewing the slides.

Review the slides for the following information:

1. Basins with water standing.

2. Drowned-out crops.

3. Hydrophytic vegetation.

1/ The definition of a wetland for the determination procedure is explained in the SCS National Food Security Act Manual (512.01).

4. Drainage activities which may constitute a prior conversion (PC, farmed wetland (FW), such as surface drains, ditches, etc.

Guidelines for interpreting office information when making wetland determinations.

Hydric Soil	ASCS Slide 1/	NWI 2/	Wetland Status
Yes	1	Yes	Wetland - W or FW
Yes	1	No	None
Yes	2	No	Wetland-W or FW 3/ (check weather info)
Yes	3	Yes or No	Wetland W or FW
Yes	0	Yes	Prior Covered - PC (Manipulation must be documented)
No	1-5	No or Yes	Artificial Wetland-W (Document reason for AW)

1/ Number listed below refers to the number of times an individual wet area was identified on the ASCS slides.
2/ FWS National Wetland Inventory Map.
3/ Check weather information concerning the years wet areas appear on the slides. If wet areas appear only on above normal precipitation years, call area non-wetland.

Some other situations that will occur and needs to be interpreted from available resources are as follows:

1. Wetland determinations on non-cropland (pasture, hayland, woodland) where the soil is a named hydric map unit. For our purposes, we will assume a wetland exists if the soil is a named hydric map unit and the area is in pasture, woodland, or non-cropland. The area also needs to be reviewed for any existing drainage that might justify a prior converted (PC) status.

2. Wetland determinations on non-cropland (pasture, hayland, and woodland) where the soil is a map unit with hydric inclusions. If an area is identified by available NWI maps, we will assume the area is a wetland. If there are no NWI wetlands identified, we will review slides of the area to determine if drowned-out areas or basins with water standing are present and follow the previously mentioned wetland chart

(Guidelines for interpreting office information when making wetland determinations). The area also needs to be reviewed for any existing drainage that might justify a prior converted (PC) status.

3. Wetland determinations on areas that are only partially drained and are playas or still seasonally flood or pond during the growing season. These areas will be considered farmed wetlands (FW).

[illegible]
[illegible]
[illegible]
[illegible]

CARIBOU CO. WETLAND INVENTORY

Starting on January 17, 1989, I started a Wetland Inventory of Caribou County, Idaho based in the Soda Springs Field Office. This paper is a record of the resources, methods, materials, and notes that I used in the inventory process. This inventory identified wetlands according to the 1985 Food Security Act (FSA) definitions. It will be used by the District Conservationist (D.C.)to assist in making wetland determinations for FSA. The D.C. is the final authority in the wetland determinations, not this inventory. If there are questions about any of the wetlands identified in this inventory, a field check is highly recommended.

All the areas that I have identified in this inventory should be considered and referred to as Potential wetlands unless they are otherwise marked.

RESOURCES

1. Biological Tech Note W-3, December 1988, was used as the main procedural guide. Frank Fink, State Biologist, was the State Wetland Inventory Coordinator. Travis James, Area Agronomist,is the Area Wetland Inventory Coordinator.

2. U.S. Fish and Wildlife National Wetland Inventory Maps (Blueline Copies), 1980, were used as the basis for initial location of wetlands in a particular section, township, and range.

3. Base Photos for the inventory were new ASCS 8 inch /mile Aerial photos that were flown in the Fall, 1987 and Spring, 1988.

4. SCS Bear Lake-Caribou County Soil Survey Party Soil Maps (Stereo-paired, 1:24,000 scale, Aerial Photos flown in 1980)were used in conjunction with a Power Stereoscope to identify and discriminate potholes from rock knobs, watercourses from ridgelines, and general topographic features. These soils maps were also used to identify areas mapped as Hydric Soils.

NOTE: only portions of the inventory area had been soil mapped before the wetland inventory was done. In those areas, the mapped soils were relied on heavily to locate potential wetland areas.

5. ASCS Aerial Compliance Slides (35 mm slides taken each year to determine compliance for Federal Agricultural Programs) were used to locate wetland areas not identified on the NWI maps or to determine changed vegetation lines or to located Farmed Wetlands that were never mapped on the NWI maps. Caribou County had only 1986, 1987, and 1988 slides available.

A. The Aerial Compliance Slides are shot along North-South flight paths that crisscross the county from West to East. Each flight path is flown to overlap the previous flight path. A Flight Path Key Map is use to record which sections each path was flown over and when 1 roll of film was used up and another roll was started. Each roll of film is numbered according to its sequence of exposure. An example of the Flight Path Key Maps is included in this Procedure Manual.

6. Available precipitation data was collected from all available sources, copies of which have been included in this book. Data for 1986, 1987, and 1988 indicates that 1986 was a "normal" year as far as precipitation goes, 1987 was the beginning of a major drought, and 1988 was the worst drought year in recent history.

METHODS AND MATERIALS

1. A large composite map labeled "Caribou County Wetland Inventory Index Map" was used to plot progress as I went.

A. The County line was marked with a wide black line.
B. Township and Range lines were marked in Blue on the map.
C. As a section was inventoried, it was crossed out on the map.
D. The index map can be used to determine which sections were inventoried.

2. Each Section was photocopied on an 11 x 17 inch paper. Where possible, 2 sections were copied on a single sheet. However, some sheets only had one section for various reasons.

A. The sections were outlined in black or blue ink.
B. The sections were labeled on the side with the abbreviation "Sec" and the section number (ex.- Sec 12, Sec 36, etc).
C. The township and range designation were also printed along the side of the section outline to ensure easy identification.

D. For the most part, the photocopies have ASCS identifying numbers, such as acreage figures, tract numbers, farm numbers, etc. somewhere on the copy. When those numbers are read right side up, North is toward the top of the page. On most of the photocopies, I included a North arrow for more rapid identification of direction.

3. All sections that were inventoried were photocopied, whether they had any wetlands on them or not. If wetlands were not found in a section, "No Wetlands" was written in large letters across the center of the photocopy.

4. Photocopies were made only of those sections that were actually inventoried. Sections that were NOT inventoried will not have photocopies in the folders.

5. Three slide projectors were set up to project each year of Compliance Slides for a particular section on to a projector screen side by side. In this way, all three years could be viewed at the same time for the subject section.

6. When a Wetland was identified in a particular section, it was located on the 11 x 17 inch photocopy and the boundaries outlined in Blue ink. Next, interior areas were colored in with a Yellow Highliter to ensure the wetland area would be highly visible.

A. Any area in the section that was difficult to identify as NOT being a wetland in my estimation was cross-hatched to help recognize it.

B. Any area that I made a mistake on that could not be corrected with "White-out" was also cross-hatched (Example: areas that were Yellow Highlighted by mistake would be cross-hatched)

NOTE: Any area on a photocopied section that is cross-hatched OR NOT bounded by blue ink with a yellow center is NOT, in my estimation, considered a wetland.

C. Boundaries of a particular wetland were determined in general from the NWI maps (very conservative), Soils Maps (general), and the 3 years of Compliance Slides (very specific). These boundaries should be considered general because of the scale I was using. When questions arise as to the actual boundaries of a wetland, a field check is recommended.

7. On the back of each photocopied section, I wrote down exactly which ASCS Photo I used, which Soils Map I used, and which Compliance Slide(s) I used.

A. The Compliance Slides were identified as follows:

1. Year-Indicates which year the Compliance Slide was taken in.

2. Slide No.-This number is the number on the slide tray not the number on the slide, except for the 1986 slides that were not stored in a Carousel Slide Tray in which case it is the number on the slide.

3. Tray No.-This number series is found on the outside of the tray box and indicates which rolls are stored in the box (ex.- 1-4, 4-8, or 8-10).

4. Roll No.-This number identifies the roll of film that has the subject slide in it. The roll no. is usually only important when using the 1986 slides that are not stored in a Carousel tray.

8. When the wetland inventory was completed on a section and all the appropriate data recorded on both sides of the photocopy (see 11.), the photocopy was filed in an "Expand-a-File" folder which was then placed in a file cabinet located in the Field Office.

8. The "Expand-a-File" folders were labeled with Township and Range designations. They were numerically arranged according to the Township number, then by the Range designation in the file cabinet.

NOTES AND COMMENTS

1. A key part of the definitions of farmed wetlands (FW) and prior converted (PC) wetlands is that they were manipulated, i.e. drained, drain tiles installed, ditched, or channeled. These features were extremely difficult to identify on the slides and the photos. Therefore, these designations were rarely used.

2. Since this inventory was completed during the winter months, ground truthing was not possible. Areas that appeared to be definitely questionable were recorded so that as soon as weather and field conditions permitted the District Conservationist and the Area Office Wetland Coordinator could go out for a field check.

3. Forest Service and BLM land were NOT inventoried. The NWI maps should be used if determinations are necessary on these lands. The only exception would be if the Federal lands were intermingled with private ground, then no effort was extended in trying to identify these small acreages of Federal ground that were located outside the basic cropland boundaries.

4. Generally, only the cropland portions of the county were inventoried for wetlands. The boundaries of the Inventory were based on how far the cropland area extended out of the valleys and into the foothills. I generally stopped at the last section to have cropland in it or the next section to it that I felt might have high potential for agricultural development. Small areas of cropland that were outside the basic large valley boundaries were not inventoried. When a 1026 is received for those areas, the D.C. will have to inventory them individually at that time. Again, the Index Map will show the boundaries of the inventory.

5. I started the Caribou Co. wetland inventory at the North end of the Portneuf/Gem/Grace Valley near Chesterfield Reservoir. The D.C. requested that I start here because the cropland area had been soil mapped last summer and the area would be part of the "Winter Review" for the Soil Survey this winter. Once the soils were approved and the wetlands mapped, the Field Office could start processing the AD-1026s for that area.

6. The general schedule was to complete the Portneuf/Gem/Grace Valley from the Fort Hall Indian Reservation to the Utah State line, then move over to the Grays Lake/Blackfoot Reservoir/Soda Springs/Bear River Valley. I would start at Grays Lake, proceed down to Blackfoot Reservoir, past Soda Springs, through Nounan Valley, and right up to the Bear Lake Co. Line. If I have time, I will move over to some of the smaller valleys, such as, Star Valley, Upper Valley, Wooley Valley, etc.. However, if I am out of time I will move across the county line into Bear River Co. and move right on down the Bear River Valley to the Utah State Line.

7. When I first started the inventory, I was averaging about 8.1 sections per day. By the end of the third week, my average was up to 1/2 township (18 sections) PLUS per day. Presently, I am averaging between 3/4 township (27 sections) and 1 township (36 sections) depending upon the landform. The lava flows are the hardest areas in which to identify potential wetlands. In these areas, speed was decreased significantly. In addition to the time involved for the actual mapping, time must also be allotted for the location, identification, possible correction, and copying of the individual sections. This process takes about 1 day per township. In Caribou County, the ASCS was in the process of changing over to new 5 inch/mile photos. I spent considerable time correcting the section corners on the new photos at the direction of the District Conservationist.

ACTUAL MAPPING PROCEDURE

The actual procedure that I used to locate and outline a wetland was based on trial and error at first. It was refined through experience and input from F. Fink and F. James(State and Area Wetland Inventory Coordinators), the D.C., and the Soil Survey Party members.

A. First, I would go the the Wetland-Inventory Index Map and determine which section i would do next. I would try to finish a Township at a time, so I would pick adjacent sections until the township was completed. By picking adjacent sections, I would often use the same photos, Soils Map, and slides, this would cut down my "search time".

B. Locate the ASCS 8 inch/mile 1987 Photo that had the section that you are looking for in its entirety (occasionally, I could not find the section I wanted entirely on one map, in that case I would photocopy the two photos and cut-and-paste the section together).

C. Photocopy the section (try to copy 2 sections at a time on the same sheet). *This is the base map -*

D. Take the photocopy and draw the section lines on in Blue ink (care should be taken that the section corners are verified for accuracy).

E. Label the sections with the Township, Range, Section number, and North arrow.

F. Locate the appropriate soil mapped stereo-pair 1:24,000 photos. Set them up with the power stereoscope to show 3-D.

G. Locate the appropriate FWS National Wetland Inventory map. Inspect the section on the map for overall wetland appearance. Get an idea of where the wetlands are located in the section.

H. Go to the stereo-paired soils map and check those general locations. Most of the time, the NWI map have fewer wetlands identified than what you will see on the soils photo. The stereo-paired soils photos will not only help differentiate potholes from rock piles, but they will also show the actual soils as they were mapped. This delineates the actual borders of hydric soils in particular, and also soils that have hydric inclusions.

I. Take the Photocopy with the prepared section lines and start drawing the wetland boundaries on it with a medium-tip blue ink pen. Draw in those areas that you are sure of first. If you have questions about some areas, remember the locations and confirm them with the Compliance Slides.

J. Now that you have the obvious wetland areas outlined with blue ink and other possible areas located, go to the Compliance Slide Flight Path Map for the years [illegible] to work with. I normally start with [illegible] and [illegible]. First because they are in carousel trays and make finding a specific slide much easier. Second, because both years were drought years and any wetland area you identify on those slides will be relatively permanent. I use the 1986 slides when I have trouble with actual borders or with the location of some of the more subtle areas (also because they are not in carousel trays so you must find the appropriate slide by hand).

K. Find the slides that cover the section you want to look at and examine them together on the screen. Look for dark green circle areas for potholes and dark green irregular shaped areas for watercourses. Rock outcrops will show up as grey areas. Match the dark green areas to the locations you have already identified and adjust the borders.

L. Outline the new areas with blue ink and change any outlines that you want to correct with "whiteout".

M. Take a Yellow Highliter and color in the blue outlined areas.

N. Place the finished photocopy in the folders and mark off the section on the Index Map.

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Attachment P

STATE WETLAND PROGRAMS AND CONTACTS

Attachment P

STATE WETLAND PROGRAMS AND CONTACTS

STATE WETLAND PROGRAMS AND CONTACTS

This section includes information provided by the Council of State Governments database entitled " A National Database of State Wetland Protection Programs and Contacts". The Users Manual for this database is provided in **Attachment I**. The database printout which identifies state wetland programs, administering agency, resources available for the program, problems, program success, as well as additional information on the program, and contacts is included following a discussion concerning each state's wetland protection efforts. The information in the database was originally gathered by EPA, and was updated for EPA by the Center for the Environment and Natural Resources of the Council of State Governments in 1988. The database has since been updated in January 1989.

Each state appears on separate pages in the text for ease of addressing and updating in the future.

California State Wetland Programs 1

California State Wetland Contacts 17

Idaho State Wetland Programs 19

Idaho State Wetland Contacts 24

Montana State Wetland Programs 26

Montana State Wetland Contacts 29

Nevada State Wetland Programs 31

Nevada State Wetland Contacts 33

North Dakota State Wetland Programs 34

North Dakota State Wetland Contacts 35

Oregon State Wetland Programs 37

Oregon State Wetland Contacts 53

South Dakota State Wetland Programs 56

South Dakota State Wetland Contacts 57

Utah State Wetland Programs 58

Utah State Wetland Contacts 59

Washington State Wetland Programs 61

Washington State Wetland Contacts 67

Wyoming State Wetland Programs 68

Wyoming State Wetland Contacts 69

California State Wetland Programs (Council of State Governments Database)

Wetland Program 1

Program Type	Inland Law
State	California
Name of Program	Policy for Preservation of Wetlands Perpetuity (PPWP)
Administering Agency	Various resources agencies act as applicable
Implementation Method	Considered as part of permit review process by various agencies
Legal Authority	The PPWP Policy is very general
Resources (Funds and Staff)	None
Lands Covered	PPWP program is the only state protection for wetlands that are not in the Coastal Zone, San Francisco Bay, Suisun Marsh or publicly owned lands
Inventory and Classification	NWI maps exist for San Francisco Bay
Activities Regulated	Projects that harm wetlands may not be approved
Exemptions	Water dependent projects Projects essential for transportation or utility No alternative site Public trust is not adversely affected Compensation is part of the project 1980 amendment exempts wetlands 1/2 acre or less if they do not have significant wetland values, compensatory restoration required
Lands Covered	Same as those defined by EPA section 404(b)(1) guidelines
Compliance	No program
Education	None
Problems	Federal authority can override state decision unless section 401 certification is denied
Success	Successful agencies implementation has occurred
EPA Role	None
Needed from EPA	Develop stronger enforcement posture and firmer stance on mitigation requirements
Taking Issues	No cases
Mitigation	No policy: California Fish and Game policy followed
Cumulative Impacts	Assessed on a subject qualitative basis only

Wetland Program 2

Program Type	State Environmental Policy Acts
State	California
Name of Program	California Environmental Quality Act '70 (similar to federal NEPA program, but not focused only on water quality)
Administering Agency	All resource agencies
Implementation Method	Requires Environmental Impact Report (EIR) for major developments Charter for environmental protection (written in generalities and dependent on local political pressure for effectiveness)
Legal Authority	CEQA of 1970
Resources (Funds and Staff)	Not applicable -- compliance on an agency-by-agency basis
Lands Covered	All inland and coastal wetlands
Inventory and Classification	NWI maps have been produced for San Francisco Bay
Activities Regulated	All activities that may impact the environment
Exemptions	Projects with minor non-significant impacts
Lands Covered	All values as per EPA section 404(b)(1) guidelines
Compliance	Agency inspection and calls received by individuals
Education	Published State Permit Handbook
Problems	Limited funding for review and compliance
Success	Process is clearly working effectively
EPA Role	None
Needed from EPA	Establish strong enforcement posture and develop criteria and method for cumulative impact assessment
Taking Issues	No cases
Mitigation	Currently developing policy
Cumulative Impacts	Subjective Evaluations

Wetland Program 3

Program Type	401 Permits
State	California
Name of Program	402 Water Quality Program
Administering Agency	State and Regional Water Quality Control Board
Implementation Method	Authorization via Water Quality Certification
Legal Authority	Porter-Cologne Water Quality Control Act of 1969
Resources (Funds and Staff)	Unknown
Lands Covered	Both tidal and non-tidal
Inventory and Classification	NWI maps have been produced for San Francisco Bay
Activities Regulated	All activities that could potentially impact water quality via point and non-point source discharges
Exemptions	None
Lands Covered	Same as defined by section 404(b)(1) guidelines
Compliance	Permit conditions, on-site inspection and calls from concerned individuals
Education	Published State permit Handbook
Problems	Need inventory mapping
Success	Program is working effectively
EPA Role	Program review
Needed from EPA	Develop stronger coordination with agency regarding section 404 wetlands issues. Need to develop criteria and method for cumulative impact assessment
Taking Issues	No cases
Mitigation	Follow California Fish and Game Policy
Cumulative Impacts	Assess on a subjective basis

Wetland Program 4

Program Type	Acquisition Programs
State	California
Name of Program	Keene-Nejedly California Wetlands Preservation Act '76
Administering Agency	Department of Fish and Game Department of Parks and Recreation
Implementation Method	Act was used (beyond its policy statement) to acquire 10 important wetlands
Legal Authority	Sec. 5814
Resources (Funds and Staff)	Funds designated for preparation of a statewide wetlands plan -- has never been produced
Lands Covered	Tidal and non-tidal waters
Inventory and Classification	Significant wetlands definition (only legislation besides Coastal Act to do so)
Activities Regulated	Not applicable
Exemptions	Not applicable
Lands Covered	Not applicable
Compliance	Not applicable
Education	Not applicable
Problems	No funding
Success	None
EPA Role	None
Needed from EPA	Assist via advance identification program
Taking Issues	Not applicable
Mitigation	Not applicable
Cumulative Impacts	Not applicable

Wetland Program 5

Program Type	Acquisition Programs
State	California
Name of Program	Waterfowl Habitat program -- Senate Concurrent Resolution '79 (no. 28) (This act followed a '76 funding cut from the Keene-Nejedly Wetlands Preservation Act)
Administering Agency	Department of Fish and Game
Implementation Method	Goal set to increase wetlands by 50 percent by the year 2000 (considered to be a $45,000,000 economic benefit to the state) Promotion to public access to wetlands
Legal Authority	See Above
Resources (Funds and Staff)	None
Lands Covered	The focus of this Act is waterfowl habitat Wetland to be increased 50 percent by year 2000
Inventory and Classification	The Act calls for a wetlands inventory by '83
Activities Regulated	Any wetlands alteration
Exemptions	Not applicable
Lands Covered	Waterfowl habitats
Compliance	Not applicable
Education	Not applicable
Problems	Lack of funding
Success	None
EPA Role	None
Needed from EPA	None
Taking Issues	Not applicable
Mitigation	Not applicable
Cumulative Impacts	Not applicable

Wetland Program 6

Program Type	Other Programs
State	California
Name of Program	Wetland/Water Use Plans -- Delta Master Recreational Plan '76 and Waterways Use Program '76
Administering Agency	Resources Agency
Implementation Method	Programs developed by the Resources Agency
Legal Authority	Both programs nonbinding land use plans
Resources (Funds and Staff)	Unknown
Lands Covered	Tidal and non-tidal wetlands
Inventory and Classification	None
Activities Regulated	Water use and recreation
Exemptions	Existing developments
Lands Covered	Water quality values
Compliance	None
Education	None
Problems	None
Success	Plans developed have been utilized for planning purposes
EPA Role	Limited to comments regarding plan as relates to section 404
Needed from EPA	Follow-up with advanced section 404 identification program would be helpful
Taking Issues	No cases
Mitigation	Not applicable
Cumulative Impacts	Not applicable

Wetland Program 7

Program Type	Other Programs
State	California
Name of Program	State Lands Public Trust Doctrine
Administering Agency	State Lands Commission, exclusive jurisdiction 70 cities, counties and districts (like Port districts) administer tidelands granted by the state
Implementation Method	Grant tidelands to localities by the state Wetlands protected by public trust Issues permits and leases
Legal Authority	Supreme Court decision of 1981 extended public trust jurisdiction which added 4,000 more miles of shoreland and inland wetland to the trust (navigable only) Cal. Govt. Code Sec. 13109, Cal. Publ. Res. Code Sec. 6301-6312, 6321-6327
Resources (Funds and Staff)	Unknown
Lands Covered	State owned tidelands and submerged lands (most of the state's tidelands are owned by the state or the legislature's public grantees in trust) Private property (tidelands and submerged lands) is protected by public trust Nontidal navigable water are in public trust as of 1981
Inventory and Classification	Due to illegal surveying, property boundaries are unclear Tidal and submerged lands are being mapped
Activities Regulated	Removal of dredged material
Exemptions	None
Lands Covered	Bottom habitat as well as other section 404(b)(1) values
Compliance	Limited to reported amounts of material removal
Education	None
Problems	Jurisdictional boundaries are sometimes unclear
Success	Have successful permit program which refers environmental issues to other resource agencies as well as conducts own in-house environmental review
EPA Role	None
Needed from EPA	None
Taking Issues	Many cases that involve litigation over state ownership
Mitigation	None required
Cumulative Impacts	Subjective evaluation

Wetland Program 8

Program Type	Acquisition Programs
State	California
Name of Program	Acquisition
Administering Agency	Department of Fish and Game (DFG)
Implementation Method	Manage state wildlife management areas (reserves) Manage two national estuarine sanctuaries Publish "coastal wetland series"
Legal Authority	Sec. 1601.03
Resources (Funds and Staff)	Unknown
Lands Covered	Wildlife reserves of the state
Inventory and Classification	California DFG has published 21 reports: "Coastal Wetland Series" which are comprehensive wetland inventories and development guides
Activities Regulated	Regulate waterfowl hunting
Exemptions	None
Lands Covered	Waterfowl protection
Compliance	Local enforcement personnel
Education	See inventory and classification above
Problems	Limited funding
Success	Good management success
EPA Role	None
Needed from EPA	None
Taking Issues	No cases
Mitigation	Not applicable
Cumulative Impacts	Not applicable

Wetland Program 9

Program Type	Floodplain Regulation
State	California
Name of Program	Streambed Program: Streambed Alteration Agreement
Administering Agency	California Department of Fish and Game
Implementation Method	Written authorization
Legal Authority	Sec. 1601-03 of the California Fish and Game Code
Resources (Funds and Staff)	Unknown
Lands Covered	Those within active streambed
Inventory and Classification	None
Activities Regulated	Dredge and fill (suction dredging)
Exemptions	None
Lands Covered	Streambed values such as riffles and pools and associated water quality values
Compliance	Site visits and response to inquiries
Education	None
Problems	Limited funding for compliance and enforcement monitoring
Success	Program functions well
EPA Role	None
Needed from EPA	Develop stronger enforcement posture for riparian streams
Taking Issues	No cases
Mitigation	Not required
Cumulative Impacts	Subjective assessment

Wetland Program 10

Program Type	Acquisition Programs
State	California
Name of Program	Rare and Endangered Plants and Animals
Administering Agency	California Department of Fish and Game: Designate an endangered species Acquisition of wetlands since 1970 Department of Fish and Game is required to notify landowners of the presence of endangered species on their land Comment and consult on other agencies' programs
Implementation Method	Permit review/coordination with individuals and other agencies
Legal Authority	CEQA
Resources (Funds and Staff)	Unknown -- sources: (a) Environmental Protection Fund, and (b) Land and Water Conservation Fund
Lands Covered	Wetlands that are habitat for endangered species
Inventory and Classification	Developed endangered species list
Activities Regulated	Not applicable
Exemptions	Not applicable
Lands Covered	Rare and endangered species
Compliance	Via section 7 consultation with USFWS
Education	None
Problems	Limited funding and knowledge of habitat requirements of most species
Success	Program has had limited success
EPA Role	None
Needed from EPA	Stronger
Taking Issues	No cases
Mitigation	Have adopted similar to USFWS
Cumulative Impacts	Subjective qualitative assessments only Impacts addressed relate to habitat loss or degradation of habitat quality

Wetland Program 11

Program Type	Acquisition Programs
State	California
Name of Program	Wildlife Conservation Board Acquisition Program Some Sanctuary Educational Programs
Administering Agency	California Department of Fish and Game
Implementation Method	Acquires wetland by (1) purchasing fee title, (2) leasing land from other agencies, and (3) purchasing easements Select acquisition sites Co-manage with federal agencies, several sanctuaries Education programs are set up at some sanctuaries
Legal Authority	Part of internal program
Resources (Funds and Staff)	Unknown
Lands Covered	19 coastal wetlands identified for priority acquisition Several sanctuaries
Inventory and Classification	None
Activities Regulated	Not applicable
Exemptions	Not applicable
Lands Covered	Not applicable
Compliance	Not applicable
Education	Have active education programs at sanctuaries Areas will be used in some cases for outdoor education
Problems	Land costs often far outweigh funds set aside for acquisition
Success	Have been able to purchase some areas
EPA Role	None
Needed from EPA	None
Taking Issues	No cases
Mitigation	None
Cumulative Impacts	Not applicable

Wetland Program 12

Program Type	Coastal Law
State	California
Name of Program	Regional CZMP
Administering Agency	San Francisco Bay Conservation and Development Commission (BCDC) (one of the first approved local CZMPs to be approved in the U.S.)
Implementation Method	Coastal Zone Management Act
Legal Authority	Cal.Govt.Code Sec. 65600-66661 (West)
Resources (Funds and Staff)	San Francisco Bay Outlined Appendix C.p.82 Kusier
Lands Covered	Tidelands and isolated diked wetlands 100 feet beyond mean high tide
Inventory and Classification	EPA sponsored inventory maps published in draft form, 1986
Activities Regulated	Dredge and fill (within 100 feet of the bay)
Exemptions	Dikes areas not subject to tidal flow inundation
Lands Covered	Same as discussed in EPA section 404(b)(1) guidelines
Compliance	Due to low funding, limited to response to agency or individual concerns
Education	None
Problems	Jurisdiction in historic diked bayland areas sometimes unclear
Success	Program is successful
EPA Role	None
Needed from EPA	Need to develop stronger enforcement posture with regard to diked baylands
Taking Issues	No cases
Mitigation	Follows Fish and Game policy
Cumulative Impacts	Subjective assessment

Wetland Program 13

Program Type	Coastal Law
State	California
Name of Program	Regional CZMP
Administering Agency	Suisan Marsh Management District
Implementation Method	Sulsun Marsh Preservation Act of 1977 (one of the few laws that protects a specific Riparian wetland--program arose from waterfowl hunting)
Legal Authority	See above
Resources (Funds and Staff)	Unknown
Lands Covered	All wetlands within Management District
Inventory and Classification	Habitat map has been developed for district
Activities Regulated	All development activities that would impact wetlands
Exemptions	None
Lands Covered	Waterfowl
Compliance	Inspection by district personnel
Education	Interpretive programs offered
Problems	Agricultural runoff (chemical and sediment) High natural salt and metal concentrations in incoming fresh water volumes
Success	Program has been successful for developing waterfowl habitat
EPA Role	None
Needed from EPA	None
Taking Issues	No cases
Mitigation	Certain areas within district have been enhanced via permit requirements for other nearby areas
Cumulative Impacts	Subject evaluations

Wetland Program 14

Program Type	Coastal Law
State	California
Name of Program	Regional CZMP
Administering Agency	Humboldt Bay Harbor Recreation and Conservation District
Implementation Method	Required compliance with under CEQA prior to permit authorization
Legal Authority	Authorized by voters in 1972
Resources (Funds and Staff)	Amount unknown Two persons
Lands Covered	Tidelands within the Humboldt Bay District
Inventory and Classification	None
Activities Regulated	All activities
Exemptions	None
Lands Covered	Same as EPA section 404(b)(1) guidelines
Compliance	Local inspection by district personnel
Education	None
Problems	Initial funding
Success	Have been successful with plan implementation
EPA Role	None
Needed from EPA	None
Taking Issues	No cases
Mitigation	Require in accordance with Fish and Game Policy
Cumulative Impacts	Make subject evaluations

Wetland Program 15

Program Type	Taxation Programs
State	California
Name of Program	Coastal Act of 1976
Administering Agency	California State Coastal Conservancy
Implementation Method	Assist local zoning Lease, sell or exchange property Tax incentives Redevelopment concepts Acquisition (by fee interests) Give grants to localities or Department of Parks and Recreation for wetland protection
Legal Authority	Coastal Act of 1976
Resources (Funds and Staff)	Amount's and staff unknown
Lands Covered	Coastal wetland Agricultural lands
Inventory and Classification	None
Activities Regulated	Not applicable
Exemptions	Not applicable
Lands Covered	Same as defined by section 404(b)(1) guidelines
Compliance	None
Education	None
Problems	Public awareness is low
Success	Moderate
EPA Role	None
Needed from EPA	Should encourage state to create greater public awareness of programs via tax guidelines
Taking Issues	No cases
Mitigation	Not applicable
Cumulative Impacts	Not applicable

Wetland Program 16

Program Type	Acquisition Programs
State	California
Name of Program	Flood Control
Administering Agency	State Reclamation Board 19011 Local authorities
Implementation Method	Designate floodplains Manages floodplains Acquires land for flood control projects
Resources (Funds and Staff)	State general funds
Lands Covered	Wetlands
Inventory and Classification	None
Activities Regulated	Acquire and manage wetlands within floodplain
Exemptions	Not applicable
Lands Covered	Same as section 404(b)(1) guidelines
Compliance	Not applicable
Education	Not applicable
Problems	Limited funding
Success	Have acquired a considerable number of flood control areas
EPA Role	None
Needed from EPA	None
Taking Issues	No cases
Mitigation	Not applicable
Cumulative Impacts	Not applicable

Wetland Program 17

Program Type	Other Programs
State	California
Name of Program	State Subdivision Map Act
Administering Agency	Local authorities
Implementation Method	Requires denial for projects that would significantly damage wildlife habitats Subdivision map must be approved by local authorities for all projects, creating 5 or more parcels of land or condominiums
Legal Authority	State subdivision map act
Resources (Funds and Staff)	No direct funds -- rely on local planning authorities
Lands Covered	Those wetlands where wildlife values would be significantly damaged
Inventory and Classification	None
Activities Regulated	All projects creating 5+ parcels of land or condominiums
Exemptions	Projects that create less than 5 parcels of land or condominiums
Lands Covered	Wildlife values
Compliance	None beyond approval process and inquiries by concerned individuals
Education	None
Problems	No real inhouse review expertise on wildlife so evaluation is subjective
Success	Have caused certain developers to alter plans to minimize wildlife impacts
EPA Role	None
Needed from EPA	Advanced identification of critical areas would be quite helpful Educational information about section 404 programs would also be very helpful
Mitigation	None
Cumulative Impacts	Subjective evaluation

Wetland Program 18

Program Type	Taxation Programs
State	California
Name of Program	Open Space Land Use -- California Land Conservation Act 1965 (Williamson Act)
Implementation Method	Tax break for agriculture "agriculture preserves" Open space protection for some wetlands Tax reduction for wetlands
Legal Authority	Williamson Act
Resources (Funds and Staff)	Amount's and staff unknown
Lands Covered	1969 amendment added wetlands and wildlife habitats, open space, to be covered under the act
Inventory and Classification	Inventories of significant wetland in some localities
Activities Regulated	Agriculture tax incentive
Exemptions	Not applicable
Lands Covered	Not applicable
Compliance	Not applicable
Education	Not applicable
Problems	Awareness level of program is low
Success	Moderate
EPA Role	None
Needed from EPA	Encourage state to create better public awareness
Taking Issues	Not applicable
Mitigation	Not applicable
Cumulative Impacts	Not applicable

Wetland Program 19

Program Type	Other Programs
State	California
Name of Program	River Reclamation
Administering Agency	State Reclamation Board
Implementation Method	Permit review
Legal Authority	Cal. Water Code Pt. 4 Sec. 8520-9377
Lands Covered	Sacramento, San Joaquin River system and tins tributaries
Inventory and Classification	None
Activities Regulated	Dredge and fill
Exemptions	None
Lands Covered	Same as those described for section 404(b)(1) guidelines
Compliance	Limited to inquiry by concerned citizens and occasional field trips downstream
Education	None
Problems	Limited funding
Success	Unknown
EPA Role	None
Needed from EPA	No cases
Taking Issues	No cases
Mitigation	No requirements for
Cumulative Impacts	Subject evaluation

Wetland Program 20

Program Type	Other Programs
State	California
Name of Program	Agency Coordination - Recent analysis of state wetland regulations which evaluated 59 relevant state statutes
Administering Agency	Resources Agency coordinates all state agencies that regulate wetlands: (1) Department of Fish and Game, (2) State Lands Commission and Division, (3) Reclamation Board, (4) Department of Water Resources, (5) San Francisco Bay Conservation and Development Commission, (6) Coastal Commission, (7) State Coastal Conservancy, (8) State Water Resources Control Board and Regional Boards, (9) Department of Parks and Recreation, (10) Department of Boating and Waterways, (11) Department of Conservation, (12) Department of Forestry, and (13) Office of Planning and Research
Implementation Method	Issue permits Review and comment on proposals whose authority lies with another agency Administer state owned lands
Legal Authority	See discussions for various state agencies
Resources (Funds and Staff)	Unknown
Lands Covered	(10 percent of California's original wetlands remain)
Inventory and Classification	NWI maps have been developed for San Francisco Bay area
Activities Regulated	Development, mining, farming, maintenance or alteration activities
Exemptions	Not applicable here -- see further discussion on each agencies' program
Lands Covered	All as defined by EPA section 404(b)(1) guidelines
Compliance	See discussions for various state agencies
Education	Published permit handbook
Problems	Published permit handbook
Success	Coordination program has been extremely successful in coordination of various resource agencies comments
EPA Role	None
Needed from EPA	Provide strong section 404 enforcement posture
Taking Issues	Cases have occurred
Mitigation	California Fish and Game has a policy similar to USFWS
Cumulative Impacts	Assessment is on a subjective qualitative basis

Wetland Program 21

Program Type	Taxation Programs
State	California
Name of Program	California Coastal Act 1976, under CZMP 1978 (the Act was passed following the completion of the California Coastal Plan)
Administering Agency	California Coastal Commission, 1972 Regional commissions
Implementation Method	Permit development conditions Means of wetland restoration Suggested mitigation measures Compensation required sometimes (part of "Interpretive Guidelines...")
Legal Authority	Cal. Pub. Res. Code Sec. 3000, 39000 (West)
Resources (Funds and Staff)	Amount unknown
Lands Covered	Wetlands landward 1000 yards above mean high tide
Inventory and Classification	"Guidelines for Wetlands..." includes classification of wetlands (USFWS definition used)
Activities Regulated	50,000 applications for development have been processed by the regional commissions in the past 10 years Size of boating facilities Dredge and fill
Exemptions	None
Lands Covered	Same as EPA section 404(b)(1) guidelines
Compliance	None
Education	Developed Interpretive Guidelines for Wetlands and other Environmentally Sensitive Habitat Areas
Problems	Limited funding to carryout program Controversy over restorability of damaged wetlands
Success	Have had successful program, given funding limitations
EPA Role	None
Needed from EPA	More closely coordinate with commission
Mitigation	Follow Fish and Game Policy
Cumulative Impacts	Subject evaluation only

Wetland Program 22

Program Type	Other Programs
State	California
Name of Program	Regional Lakeshore Program
Administering Agency	Tahoe Regional Planning Agency Local authorities
Implementation Method	Development plan review and authorization
Legal Authority	Cal. Govt. Code Sec. 67000-67130
Resources (Funds and Staff)	Amounts unknown and personnel unknown
Lands Covered	Placer and El Dorado counties Lake Tahoe Tahoe watershed
Inventory and Classification	None
Activities Regulated	All development activities
Exemptions	None
Lands Covered	Same as those defined by EPA section 404(b)(1) guidelines
Compliance	None
Education	None
Problems	Need greater public awareness about program(s)
Success	Programs have been successful in causing planned development with concern for environmental issues
EPA Role	Section 404 review process
Needed from EPA	Need to establish stronger enforcement posture
Taking Issues	No cases
Mitigation	Plans often require mitigation
Cumulative Impacts	Subjective evaluation

Wetland Program 23

Program Type	Floodplain Regulation
State	California
Name of Program	Flood Control
Administering Agency	State Reclamation Board 19011 Local authorities
Implementation Method	Designate floodplains Manages floodplains Acquires land for flood control projects
Resources (Funds and Staff)	State general funds
Lands Covered	Wetlands
Inventory and Classification	None
Activities Regulated	Acquire and manage wetlands within floodplain
Exemptions	Not applicable
Lands Covered	Same as section 404(b)(1) guidelines
Compliance	Not applicable
Education	Not applicable
Problems	Limited funding
Success	Have acquired a considerable number of flood control areas
EPA Role	None
Needed from EPA	None
Taking Issues	No cases
Mitigation	Not applicable
Cumulative Impacts	Not applicable

Wetland Program 24

Program Type	Acquisition Programs
State	California
Name of Program	Coastal Act of 1976
Administering Agency	California State Coastal Conservancy
Implementation Method	Assist local zoning Lease, sell or exchange property Tax incentives Redevelopment concepts Acquisition (by fee interests) Give grants to localities or Department of Parks and Recreation for wetland protection
Legal Authority	Coastal Act of 1976
Resources (Funds and Staff)	Amount's and staff unknown
Lands Covered	Coastal wetland Agricultural lands
Inventory and Classification	None
Activities Regulated	Not applicable
Exemptions	Not applicable
Lands Covered	Same as defined by section 404(b) guidelines
Compliance	None
Education	None
Problems	Public awareness is low
Success	Moderate
EPA Role	None
Needed from EPA	Should encourage state to create greater public awareness of programs via tax guidelines
Taking Issues	No cases
Mitigation	Not applicable
Cumulative Impacts	Not applicable

California State Wetland Contacts (Council of State Governments Database)

Wetland Contact 1

Program Type	Coastal Wetland Program
Name	Devon Bates
Organization	California Coastal Commission
Address	631 Howard Street
	4th floor
City	San Francisco
State	California
Zip Code	94105
Phone Number	(415) 543-8555

Wetland Contact 2

Program Type	401 Permits
Name	Jack Hodges
Organization	State Water Quality Control Board
City	Sacramento
State	California
Phone Number	(916) 322-0207

Wetland Contact 3

Program Type	Legal Council/Legislative Liason
Name	Paul Thayer
Organization	California Coastal Commission
Address	921 11th Street
	Room 1200
City	Sacramento
State	California
Zip Code	95814
Phone Number	(916) 445-6067

Wetland Contact 4

Program Type	Mapping
Name	Jon Van Coops
Organization	California Coastal Commission
Address	631 Howard Street
	4th Floor
City	San Francisco
State	California
Zip Code	94105
Phone Number	(415) 543-8555

Wetland Contact 5

Program Type	Legal Council/Legislative Liason
Name	Roy Govman
Organization	California Coastal Commission
Address	631 Howard Street
	4th Floor
City	San Francisco
State	California
Zip Code	94105
Phone Number	(415) 543-8555

Wetland Contact 6

Program Type	Other Programs
Name	Nancy Wakeman
Organization	BCDC Bay Permits and Jurisdiction
State	California
Phone Number	(415) 557-3686

Wetland Contact 7

Program Type	Other Programs
Name	Jonathan Smith
Organization	BCDC Bay Permits and Jurisdiction
State	California
Phone Number	(415) 557-3686

Wetland Contact 8

Program Type	Other Programs
Name	Don Lollock
Organization	Environmental Services Branch Fish and Game Dept.
State	California
Phone Number	(916) 445-1383

Wetland Contact 9

Program Type	Other Programs
Name	Nancy Cave
Organization	State Enforcement Coordinator State Enforcement Commission
Address	921 11th street Room 1200
City	Sacramento
State	California
Zip Code	95814
Phone Number	(415) 543-8555

Wetland Contact 10

Program Type	Flood Plain Programs
Name	A. Jean Brown
Organization	Dept. of Water Resources
Address	P.O. Box 942836
City	Sacramento
State	California
Zip Code	94236-0001

Idaho State Wetland Programs (Council of State Governments Database)

Wetland Program 1

Program Type	Section 401 Permits
State	Idaho
Name of Program	Section 401 - Water Quality Certification
Administering Agency	Division of Environmental Quality, Bureau of Water Quality
Implementation Method	Water Quality Certification
Legal Authority	Section 401
Resources (Funds and Staff)	106 funds
Lands Covered	All surface and groundwaters of the state
Inventory and Classification	Perennial rivers -- USGS Department of Fish and Game -- classified rivers and streams by type/quality of fishing Northwest river study has extensive resource data base
Activities Regulated	Defined by federal government
Exemptions	Defined by federal government
Lands Covered	Water Quality - no specific water quality standards for wetlands
Compliance	Have enforcement capabilities under Water Quality Standards
Education	Quarterly newsletter distributed to approximately 1500 people Biannual water quality status report discusses activities, defines priorities Annual Environmental Quality Profile Report Training for specific programs (i.e., Wastewater Treatment Operator Training)
Problems	Funding at Federal and state level Water quality standards - EPA may promulgate standards for Idaho because proposed standards are unacceptable (antidegradation policy)
Success	Not sure how successful No discrete wetlands program Passive, not active program
EPA Role	Provide major funding source
Needed from EPA	Funding (undo Graham-Rudman) More funding for section 314 of Clean Water Act, Clean Lakes Program

Wetland Program 2

Program Type	Acquisition Programs
State	Idaho
Name of Program	Idaho Natural Heritage Program (nongame checkoff funds)
Administering Agency	Cooperative effort between Natural Conservancy, Idaho Department of Fish and Game, Idaho Department of Parks and Recreation
Implementation Method	Acquisition Work with federal agencies for conservation of resources on federal land
Legal Authority	No specific legislation
Resources (Funds and Staff)	Nongame checkoff The Nature Conservancy Federal Land and Water Conservation Fund
Lands Covered	Criteria for areas of significant natural value: -system relatively unimpacted by human development, -rarity, -degree of threat
Inventory and Classification	Have computer data base and computerized map which stores information on specific natural area sites
Activities Regulated	Not applicable - not a regulatory program
Compliance	Only have compliance activities on their preserves. Control access and some activities Waterfowl hunting and fishing is allowed, as water in state is owned by the state
Education	Slide presentations each year oriented toward specific agencies Public information presentations
Problems	Funding Public lands policy and open range concept conflict with wetland protection Need good quality water as input to wetlands
Success	Not sure how successful. No discrete wetlands program. Passive - not active program
EPA Role	Significant EPA role through funding for NW River Study Informal exchange of information fairly good
Needed from EPA	Not sure
Taking Issues	Not had to deal with taking. Conservative government - not concerned with wetlands on private property
Mitigation	No formal mitigation plan
Cumulative Impacts	No method for evaluating

Wetland Program 3

Program Type	Acquisition Programs
State	Idaho
Name of Program	Idaho Fish and Game Acquisition Program
Administering Agency	Department of Fish and Game
Implementation Method	Fee simple acquisition Purchase only from willing sellers
Legal Authority	Idaho Code 36-104 (b) 7 Idaho Code 36-107 (c)
Resources (Funds and Staff)	Hunting license fees Federal Aid Programs: Pittman-Robertson and Dingle-Johnson MARSH program through Ducks Unlimited
Lands Covered	Endangered species habitat Wildlife lands within borders of existing holdings Other types of land
Inventory and Classification	Have inventories of lands and resources currently owned and lists of land they would like to purchase
Activities Regulated	Approximately 100,000 acres of land owned in fee title Approximately 100,000 acres controlled through easements, licenses, and coop agreement
Compliance	Compliance monitoring conducted on stated owned properties
Education	All lands are open to public use, and use is encouraged via: 1) writeups in wildlife magazines, 2) TV programs, 3) news media releases and printed regulations, and 4) areas posted and signed for public use
Problems	Lack of funding Counties sometimes oppose state acquisition of properties because of reduction in tax base. Fine money collected from state enforcement of game laws goes for statewide school programs
Success	Successful
EPA Role	EPA sometimes serves in an advisory role on permit applications
Needed from EPA	Provide additional funding

Wetland Program 4

Program Type	State Environmental Policy Acts
State	Idaho
Name of Program	Environmental Protection and Health Act
Administering Agency	Division of Environment
Implementation Method	Broad scope of legislation. Covers air and water pollution along with hazardous waste regulation Has numerous associated regulations for each program
Legal Authority	Idaho Code, Title 39, Chapter 1
Resources (Funds and Staff)	Various state and federal funds
Lands Covered	Statewide jurisdiction - protection of environment, health concerns
Inventory and Classification	No comprehensive wetland inventory
Activities Regulated	Air, water, hazardous material pollution
Exemptions	Have lists
Compliance	Administrative, civil, criminal penalties for noncompliance
Education	Newsletter features articles on the act News releases are prepared when enforcement action is undertaken
EPA Role	No role
Needed from EPA	Funding Manpower in the field
Taking Issues	Not an issue
Mitigation	No formal mitigation plan
Cumulative Impacts	No method for evaluating
	No method for evaluating

Wetland Program 5

Program Type	Taxation Programs
State	Idaho
Name of Program	Idaho Natural Heritage Program (nongame checkoff funds)
Administering Agency	Cooperative effort between Nature Conservancy, Idaho Department of Fish and Game, and the Idaho Department of Parks and Recreation
Implementation Method	Acquisition Work with Federal agencies for conservation of resources on Federal land
Legal Authority	No specific legislation
Resources (Funds and Staff)	Nongame checkoff The Nature Conservancy Federal Land and Water Conservation Fund
Lands Covered	Criteria for areas of significant natural value: -system relatively unimpacted by human development, -rarity, -degree of threat
Inventory and Classification	Have computer data base and computerized map which stores information on specific natural area sites
Activities Regulated	Not applicable - not a regulatory program
Compliance	Only have compliance activities on their preserves. Control access and some activities Waterfowl hunting and fishing is allowed, as water in state is owned by the state
Education	Slide presentations each year oriented toward specific agencies Public information presentations
Problems	Funding Public lands policy and open range concept conflict with wetland protection Need good quality water as input to wetlands
Success	Not sure how successful. No discrete wetlands program. Passive - not active program
EPA Role	Significant EPA role through funding for NW River Study Informal exchange of information fairly good
Needed from EPA	Not sure
Taking Issues	Not had to deal with taking. Conservative government - not concerned with wetlands on private property
Mitigation	No formal mitigation plan
Cumulative Impacts	No method for evaluating
	No method for evaluating

Idaho State Wetland Contacts (Council of State Governments Database)

Wetland Contact 1

Program Type	401 Permits
Name	Jerry Yoder
Organization	Bureau of Water Quality Division of Environmental Quality
Address	450 West State Street
City	Boise
State	Idaho
Zip Code	83720
Phone Number	(208) 334-5860

Wetland Contact 2

Program Type	Acquisition Programs
Name	Steve Caicco
Organization	Natural Heritage Program
Address	4696 Overland Road Suite 518
City	Boise
State	Idaho
Zip Code	83705
Phone Number	(208) 334-3402

Wetland Contact 3

Program Type	Acquisition Programs
Name	Dick Norrell
Organization	Fish and Game Realty Dept.
Address	P.O. Box 25
City	Boise
State	Idaho
Zip Code	83707
Phone Number	(208) 334-3180

Wetland Contact 4

Program Type	Other Programs
Name	Signe Blair
Organization	Fish and Wildlife Services
State	Idaho
Phone Number	(208) 334-1931

Wetland Contact 5

Program Type	Other Programs
Name	Ralph Pierson
Organization	Dept. of Fish and Game
Address	P.O. Box 25
City	Boise
State	Idaho
Zip Code	83707
Phone Number	(208) 334-2920

Wetland Contact 6

Program Type	Flood Plain Programs
Name	Lotwick I. Reese
Organization	Dept. of Water Resources
Address	State House
City	Boise
State	Idaho
Zip Code	83720

Montana State Wetland Programs (Council of State Governments Database)

Wetland Program 1

Program Type	Floodplain Regulation
State	Montana
Name of Program	310 Law for Streambed Protection
Administering Agency	Department of Fish, Wildlife and Parks
Implementation Method	Permit program
Legal Authority	Montana Revised Codes Ann. tit. 75, ch. 7 -- no authority for specific wetland protection.
Resources (Funds and Staff)	Unknown
Lands Covered	Limited to those within stream beds and banks
Inventory and Classification	None
Activities Regulated	Private development projects
Exemptions	State development projects; Emergency operations
Lands Covered	Same as those defined by EPA Section 404(b)(1) guidelines
Compliance	Agency acts on reports provided by other agencies or individuals
Education	None
Problems	Limited funding and limited to wetlands within banks of stream
Success	Very successful
EPA Role	None
Needed from EPA	Needs to establish strong enforcement posture via Section 404 program
Taking Issues	No cases
Mitigation	No policy
Cumulative Impacts	Evaluations based on subjective assessment

Wetland Program 2

Program Type	Floodplain Regulation
State	Montana
Name of Program	124 Law for Stream Protection
Administering Agency	Department of Fish, Wildlife and Parks
Implementation Method	Permit program
Legal Authority	Montana Revised Codes Ann. tit. 87, ch. 5 -- no authority for specific wetland protection
Resources (Funds and Staff)	Amount is unknown: One staff
Lands Covered	Stream beds and banks
Inventory and Classification	None
Activities Regulated	State dredge and fill actions and/or alteration
Exemptions	Emergency operations
Lands Covered	Same as those defined by EPA Section 404(b)(1) guidelines
Compliance	Agency acts on reports provided to agency by other agencies or individuals
Education	None
Problems	Limited funding and limited to wetlands within banks of streams
Success	Very successful
EPA Role	None
Needed from EPA	Need to establish strong Section 404 enforcement posture via Section 404 program
Taking Issues	No cases
Mitigation	No policy
Cumulative Impacts	Evaluation based on subjective judgments

Wetland Program 3

Program Type	Floodplain Regulation
State	Montana
Name of Program	Floodplain Regulation (100 year)
Administering Agency	State Lands Commission
Implementation Method	State approves local ordinances
Legal Authority	Sec. 89 -3503 to -35009
Resources (Funds and Staff)	Amount unknown: One person
Lands Covered	Floodplains and floodways
Inventory and Classification	FEMA flood zone maps
Activities Regulated	Alteration(s) to stream flows
Exemptions	Maintenance of existing structures
Lands Covered	None
Compliance	Acts on what is discovered or reported
Education	None
Problems	Limited to floodplains and floodways
Success	Very successful with good local cooperation
EPA Role	None
Needed from EPA	Provide close coordination via Section 404 permit process
Taking Issues	No cases
Mitigation	No policy
Cumulative Impacts	No assessment made -- rely on other resource agencies

Wetland Program 4

Program Type	Other Programs
State	Montana
Name of Program	Water Quality Program Regulation
Administering Agency	Department of Health and Environmental Services, Water Quality Bureau
Implementation Method	Permit program
Legal Authority	State adopted Section 404 program
Resources (Funds and Staff)	Amount unknown: Two persons
Lands Covered	Those within streambank and bed
Inventory and Classification	None
Activities Regulated	Point source and non-point source discharges into Montana waters
Exemptions	Exemption applies if discharges fall below minimum standards
Lands Covered	Those defined by EPA Section 404(b)(1) guidelines
Compliance	Amount's limit active program. Compliance limited to discoveries during routine inspections or complaints called in
Education	None
Problems	Funding limits having a much stronger program. Laws not broad enough to protect all wetland types
Success	State has had an excellent record of actively being involved with the Section 404 program via section 401 water quality certification. State agency will deny water quality certification as appropriate
EPA Role	Limited to section 401 and Section 404 review and comment
Needed from EPA	EPA needs to establish strong enforcement posture over wetlands to support state effort. EPA should coordinate more closely with regard to the section 401 and Section 404 process. Need criteria and standards for forecasting cumulative reports
Taking Issues	No cases
Mitigation	No mitigation policy
Cumulative Impacts	Assessment is restricted to a subjective evaluation

Montana State Wetland Contacts (Council of State Governments Database)

Wetland Contact 1

Program Type	404 Permits
Name	Army Corps of Engineers
Address	Federal Building
City	Helena
State	Montana
Zip Code	59626
Phone Number	(406) 444-6670

Wetland Contact 2

Program Type	401 Permits
Name	Ken Chrest
Organization	Water Quality Bureau
Address	Cogswell Building
City	Helena
State	Montana
Zip Code	59620
Phone Number	(406) 444-2406

Wetland Contact 3

Program Type	Waterfowl Stamp Program
Name	Jeff Herbert
Organization	Dept. of Fish, Wildlife and Parks
Address	1420 E. Sixth Ave.
City	Helena
State	Montana
Zip Code	59620
Phone Number	(406) 444-2612

Wetland Contact 4

Program Type	Other Programs
Name	Steve Potts
Organization	U.S. Environmental Prot. Agency
Address	Federal Building
City	Helena
State	Montana
Zip Code	59626
Phone Number	(406) 449-5486

Wetland Contact 5

Program Type	Other Programs
Name	Steve Odden
Organization	U.S. Fish and Wildlife Service
Address	Federal Building
City	Billings
State	Montana
Zip Code	59101

Wetland Contact 6

Program Type	Other Programs
Name	Ken Chrest
Organization	Dept. of Fish, Wildlife and Parks
Address	1420 East 6th Avenue
City	Helena
State	Montana
Zip Code	59620
Phone Number	(406) 444-2445

Wetland Contact 7

Program Type	Other Programs
Name	Dori Passman
Organization	State Lands Commission
Address	Federal Building
City	Helena
State	Montana
Zip Code	59620
Phone Number	(406) 444-2074

Wetland Contact 8

Program Type	Flood Plain Programs
Name	John Hammill
Organization	Dept. of Natural Resources and Conservation: Water Resources
Address	1520 East 6th Avenue
City	Helena
State	Montana
Zip Code	59620

Nevada State Wetland Programs (Council of State Governments Database)

Wetland Program 1

Program Type	Other Programs
State	Nevada
Name of Program	Best Management Practices
Administering Agency	Department of Conservation and Natural Resources
Implementation Method	Permit authorization
Legal Authority	Section 208, Clean Water Act
Resources (Funds and Staff)	Unknown
Lands Covered	No wetlands regulated or protected. However, wetlands often develop within drainways
Inventory and Classification	None
Activities Regulated	State regulates disposal of drained water
Exemptions	Drainage
Lands Covered	None
Compliance	Site inspection and response to inquiries by concerned individuals
Education	None
Problems	Requirements of program afford little or no protection for created wetlands
Success	Not applicable
EPA Role	Program review
Needed from EPA	Develop ways to encourage wetland development and maintenance
Taking Issues	No cases
Mitigation	Not applicable
Cumulative Impacts	Not applicable

Wetland Program 2

Program Type	Other Programs
State	Nevada
Name of Program	Critical Area Zoning
Administering Agency	State Division of Lands, Department of Environmental Protection (for Lake Tahoe), Department of Fish and Game (Sec. 501.105)
Implementation Method	Permit/Letter Authorization
Legal Authority	Nev. Rev. Stat. Sec. 321.595, Sec. 501.105
Resources (Funds and Staff)	Amount unknown State and Federal funds
Lands Covered	Navigable waters Lake Tahoe
Inventory and Classification	No mapping, but follow USFWS wetlands classification scheme
Activities Regulated	Dredge and fill
Exemptions	Existing structures and maintenance thereof
Lands Covered	Same as those defined by EPA section 404(b)(1) guidelines
Compliance	Site visits and response to inquiries by concerned individuals
Education	None
Problems	Limited funding
Success	Successful planning effort for mitigation/environmental impacts
EPA Role	None
Needed from EPA	Develop strong enforcement posture
Taking Issues	No cases
Mitigation	No formal policy, but requires mitigation for significant impacts to fish and wildlife resources
Cumulative Impacts	Conduct subjective evaluations

Nevada State Wetland Contacts (Council of State Governments Database)

Wetland Contact 1

Program Type	Other Programs
Name	Lew Dodgion
Organization	Div. of Env. Protection
Address	201 S. Fall Street
City	Carson City
State	Nevada
Zip Code	89710
Phone Number	(702) 885-4670

Wetland Contact 2

Program Type	Other Programs
Name	Pam Wilcox
Organization	Nevada State Lands
State	Nevada
Phone Number	(702) 885-4363

Wetland Contact 3

Program Type	Other Programs
Name	Bill Morgan
Organization	Tahoe Regional Planning Agency
State	Nevada
Phone Number	(702) 588-4547

Wetland Contact 4

Program Type	Other Programs
Name	Dave Ziegler
Organization	Tahoe Regional Planning Agency
State	Nevada
Phone Number	(702) 588-4547

Wetland Contact 5

Program Type	Flood Plain Programs
Name	Robert Andrews, Director
Organization	Div. of Engineering Management
Address	Capitol Complex
City	Carson City
State	Nevada
Zip Code	89710

North Dakota State Wetland Programs (Council of State Governments Database)

Wetland Program 1

Program Type	401 Permits
State	North Dakota
Name of Program	State Water Quality Certification Program - Discharges and Modification of State Waters
Administering Agency	State Water Resources Commission
Implementation Method	Permit Program
Legal Authority	N.D. Cent Code Subsec. 61-01-22, 61-02-14, 61-02-20
Resources (Funds and Staff)	Unknown
Lands Covered	All wetlands associated with state waters - isolated wetlands not covered
Inventory and Classification	Yes
Activities Regulated	Channel modifications, construction of dikes and dams, drainage of certain ponds, sloughs and lakes
Exemptions	-Farm ponds -New state waters
Lands Covered	Same as Clean Water Act
Compliance	None
Education	None
Problems	Public support for wetlands protection is low
Success	Low
EPA Role	Limited to 404 review
Needed from EPA	Need to require 404(b)(1) analysis and should show a stronger overall enforcement posture
Taking Issues	No cases.
Mitigation	Required when impacts occur
Cumulative Impacts	Vast numbers of isolated prairie pot hole wetlands are being lost. Cumulative impacts considered in evaluations, but no quantitative criteria for evaluation has been developed
access number	271

North Dakota State Wetland Contacts (Council of State Governments Database)

Wetland Contact 1

Program Type	404 Permits
Name	Michael T. Sauer
Organization	State Dept. of Health
Address	1200 Missouri avenue
City	Bismarck
State	North Dakota
Zip Code	58505
Phone Number	(701) 224-2354
Access Number	162

Wetland Contact 2

Program Type	401 Permits
Name	Michael T. Sauer
Organization	State Dept. of Health
Address	1200 Missouri avenue
City	Bismarck
State	North Dakota
Zip Code	58505
Phone Number	(701) 224-2354
Access Number	163

Wetland Contact 3

Program Type	Legal Council/Legislative Liason
Name	State Water Commission
Address	State Capital
City	Bismarck
State	North Dakota
Zip Code	58505
Phone Number	(701) 224-2750
Access Number	164

Wetland Contact 4

Program Type	Other Programs
Name	Michael G. McKenna
Organization	Natural Resource Coordinator Game and Fish Dept.
Address	100 Bismarck Expressway
City	Bismarck
State	North Dakota
Zip Code	58505
Phone Number	(701) 221-6300
Access Number	165

Wetland Contact 5

Program Type	Flood Plain Programs
Name	William Hanson
Organization	State Water Commission
Address	900 East Boulevard
City	Bismarck
State	North Dakota
Zip Code	58505
Access Number	467

Oregon State Wetland Programs (Council of State Governments Database)

Wetland Program 1

Program Type	Section 401 Permits
State	Oregon
Name of Program	Water Quality Certification Program
Administering Agency	Department of Environmental Quality
Implementation Method	Water Quality Certification
Legal Authority	Section 401, Clean Water Act
Resources (Funds and Staff)	Federal funds through the Clean Water Act State general revenue funds
Lands Covered	Lands covered by federal agencies which issue permits: Coast Guard, Corps of Engineers (about 600/year), and FERC (about 12/year) Due to NEDC lawsuit, all waters now subject to section 401 which includes lakes greater than 20 acres and streams with flows greater than 5 ft.3/sec.
Inventory and Classification	Inventories/maps are available for waters of the state, including surface and groundwater
Activities Regulated	Defined by federal government
Exemptions	Defined by federal government
Lands Covered	Water quality - no specific water quality standards developed for wetlands. Water quality standards are developed for each basin which are primarily the same throughout the state with some east to west differences
Compliance	Enforcement section in regional operations division can bring civil and criminal penalties for noncompliance
Education	Minimal ("poor") education program
Problems	Hazardous waste threats to water quality Massive water quality cleanup in 1950s and 1960s. Since 1969, primarily just maintenance
Success	Very successful
EPA Role	Strict "crushing watchdog" role Quarterly reviews Used to provide technical assistance (not much now)
Needed from EPA	Need more technical assistance (like EPA used to do)

Wetland Program 2

Program Type	Taxation Programs
State	Oregon
Name of Program	Riparian Lands Tax Incentive Program
Administering Agency	Oregon Department of Fish and Wildlife Soil and Water Conservation Districts
Implementation Method	Complete exemption of county property tax 25% personal state income tax exemption for money spent on habitat improvement
Legal Authority	Oregon Laws Chapter 720, 1981
Resources (Funds and Staff)	No funding (therefore not very successful) Department had to absorb costs
Lands Covered	Any land on a stream, can include up to 100′ landward on each side of a stream. Must be on agricultural, range or forest lands (exclusion for urban areas)
Inventory and Classification	No inventory Information was supplied to the USFWS for their wetlands classification
Activities Regulated	Tax break for protecting riparian areas
Exemptions	Urban areas. Program only covers agricultural, range or forest lands
Lands Covered	Riparian areas
Compliance	Implied compliance with penalty provisions of up to five years back taxes. In practice there is little monitoring
Education	Statewide distribution of program brochure
Problems	No funds for implementation of protection measures which are required by the Department (for example, fencing to exclude cattle) Just tax break is not enough incentive for program, the tax incentive was so low it was not effective Fencing disliked by cattlemen Agricultural community is very suspicious of resource agencies
Success	Small quantitative success, but did focus public attention on value of riparian areas Provides one of first programs in the nation to address riparian protection
EPA Role	None
Needed from EPA	Felt EPA could assist but not sure how Funding
Taking Issues	Tax incentive is not taking -- is "giving."
Mitigation	No plan - only present for coastal estuaries
Cumulative Impacts	Subjective biological judgment Stream survey methods

Wetland Program 3

Program Type	Research
State	Oregon
Name of Program	Nongame Wildlife Program
Administering Agency	Department of Fish and Wildlife
Implementation Method	Provides funds for research, monitoring, development, and some acquisition of nongame wildlife areas 3/4 of the funds available go toward contractual services for research, monitoring, and development
Legal Authority	Nongame Wildlife Checkoff Bill, 1979
Resources (Funds and Staff)	50% of funds from nongame checkoff 50% of funds from sale of hunting licenses
Lands Covered	Several projects geared toward species which occur in wetlands (shorebirds, white pelicans), but program is not specifically aimed at wetlands
Activities Regulated	Conduct research, monitoring, development, and some acquisition Future plans include research on owls, harbor seals, sea lions, snowy plovers, bats, turtles, and other wildlife
Lands Covered	Wildlife habitat
Education	No funds provided for information and education
Problems	Lack of funding (no acquisition now) Lack of information on poorly understood wildlife species No funding for information and education Lack of appreciation for non-game wildlife.
Success	An extensive wetland inventory project in a metropolitan area was presented to the Zoning Commission and wetlands were protected through zoning Four parcels of wetlands purchased with checkoff money Constructed dikes and enhanced an additional 200 acres of wetlands
Needed from EPA	Not sure of other ways EPA can help Enhanced raptor nest platforms on large transmission lines

Wetland Program 4

Program Type	Acquisition Programs
State	Oregon
Name of Program	Nongame Wildlife Program
Administering Agency	Department of Fish and Wildlife
Implementation Method	Provides funds for research, monitoring, development, and some acquisition of nongame wildlife areas 3/4 of the funds available go toward contractual services for research, monitoring, and development
Legal Authority	Nongame Wildlife Checkoff Bill, 1979
Resources (Funds and Staff)	50% of funds from nongame checkoff 50% of funds from sale of hunting licenses
Lands Covered	Several projects geared toward species which occur in wetlands (shorebirds, white pelicans), but program is not specifically aimed at wetlands
Activities Regulated	Conduct research, monitoring, development, and some acquisition Future plans include research on owls, harbor seals, sea lions, snowy plovers, bats, turtles, and other wildlife
Lands Covered	Wildlife habitat
Education	No funds provided for information and education
Problems	Lack of funding (no acquisition now) Lack of information on poorly understood wildlife species No funding for information and education Lack of appreciation for non-game wildlife
Success	An extensive wetland inventory project in a metropolitan area was presented to the Zoning Commission and wetlands were protected through zoning Four parcels of wetlands purchased with checkoff money Constructed dikes and enhanced an additional 200 acres of wetlands
Needed from EPA	Not sure of other ways EPA can help Enhanced raptor nest platforms on large transmission lines

Wetland Program 5

Program Type	Taxation Programs
State	Oregon
Name of Program	Nongame Wildlife Program
Administering Agency	Department of Fish and Wildlife
Implementation Method	Provides funds for research, monitoring, development, and some acquisition of nongame wildlife areas 3/4 of the funds available go toward contractual services for research, monitoring, and development
Legal Authority	Nongame Wildlife Checkoff Bill, 1979
Resources (Funds and Staff)	50% of funds from nongame checkoff 50% of funds from sale of hunting licenses
Lands Covered	Several projects geared toward species which occur in wetlands (shorebirds, white pelicans), but program is not specifically aimed at wetlands
Activities Regulated	Conduct research, monitoring, development, and some acquisition Future plans include research on owls, harbor seals, sea lions, snowy plovers, bats, turtles, and other wildlife
Lands Covered	Wildlife habitat
Education	No funds provided for information and education
Problems	Lack of funding (no acquisition now) Lack of information on poorly understood wildlife species No funding for information and education Lack of appreciation for non-game wildlife
Success	An extensive wetland inventory project in a metropolitan area was presented to the Zoning Commission and wetlands were protected through zoning Four parcels of wetlands purchased with checkoff money Constructed dikes and enhanced an additional 200 acres of wetlands
Needed from EPA	Not sure of other ways EPA can help Enhanced raptor nest platforms on large transmission lines

Wetland Program 6

Program Type	Research
State	Oregon
Name of Program	South Slough Natural Estuarine Sanctuary
Administering Agency	Oregon Division of State Lands
Implementation Method	Research Acquisition: purchased large part of a watershed (includes about 3,800 acres of timber). Goals of management are to preserve the natural integrity of the system
Legal Authority	Natural Estuarian Program (NOAA - Department of Commerce)
Resources (Funds and Staff)	Cooperative funding. Start-up funding provided by the Federal government. Operating funds from state
Lands Covered	South Slough National Estuarian Sanctuary
Inventory and Classification	Working on an inventory. Have a cursory inventory to create an atlas of resources
Activities Regulated	Purchased large part of a watershed (approximately 5,000 acres, 38,000 acres of timber) Regulate use of motorized boats in shallow water No commercial harvest of timber No herbicides Coordinate research, baseline inventory Sponsor outside research Collect meteorological, toxic, physical information Tidal wetlands research Conduct long term research to monitor for long term changes Conduct research on mitigation and how to create a wetland Only commercial activity allowed is oyster culture
Lands Covered	Natural integrity of the system
Compliance	State law enforcement officers handle compliance, not estuarian staff
Education	Have an interpretive center (worth 1/2 million dollars), with museum quality exhibits Educational school curriculum Teacher education programs Sponsor a symposium on estuarian research every other year
Problems	Only 11 year old sanctuary (young). Needs research, but research funds are tight Potential development on slough may pose a serious threat to water quality from excess cobalt, cadmium, and other substances No effective oil spill plan Need to attract good researchers
Success	Very new sanctuary. Measurable successes will go beyond the physical boundary of the sanctuary and provide new approaches to wetland management
EPA Role	No role. One contact with EPA in 10 months. Do not know who to talk to, but would like to

	involve EPA in the sanctuary program.
Needed from EPA	Would like to cooperate with EPA to assess toxic materials problems in sediments Knows EPA has equipment they could use, but does not know how to get in touch with the right people
Mitigation	Currently conducting research on mitigation and how to "create" a wetland

Wetland Program 7

Program Type	Coastal Law
State	Oregon
Name of Program	South Slough Natural Estuarine Sanctuary
Administering Agency	Oregon Division of State Lands
Implementation Method	Research Acquisition: purchased large part of a watershed (includes about 3,800 acres of timber). Goals of management are to preserve the natural integrity of the system
Legal Authority	Natural Estuarian Program (NOAA - Department of Commerce)
Resources (Funds and Staff)	Cooperative funding. Start-up funding provided by the federal government. Operating funds from state
Lands Covered	South Slough National Estuarian Sanctuary
Inventory and Classification	Working on an inventory. Have a cursory inventory to create an atlas of resources
Activities Regulated	Purchased large part of a watershed (approximately 5,000 acres, 38,000 acres of timber) Regulate use of motorized boats in shallow water No commercial harvest of timber No herbicides Coordinate research, baseline inventory Sponsor outside research Collect meteorological, toxic, physical information Tidal wetlands research Conduct long term research to monitor for long term changes Conduct research on mitigation and how to create a wetland Only commercial activity allowed is oyster culture
Lands Covered	Natural integrity of the system
Compliance	State law enforcement officers handle compliance, not estuarian staff
Education	Have an interpretive center (worth 1/2 million dollars), with museum quality exhibits Educational school curriculum Teacher education programs Sponsor a symposium on estuarian research every other year
Problems	Only 11 year old sanctuary (young). Needs research, but research funds are tight Potential development on slough may pose a serious threat to water quality from excess cobalt, cadmium, and other substances No effective oil spill plan Need to attract good researchers
Success	Very new sanctuary. Measurable successes will go beyond the physical boundary of the sanctuary and provide new approaches to wetland management
EPA Role	No role. One contact with EPA in 10 months. Do not know who to talk to, but would like to

	involve EPA in the sanctuary program
Needed from EPA	Would like to cooperate with EPA to assess toxic materials problems in sediments Knows EPA has equipment they could use, but does not know how to get in touch with the right people
Mitigation	Currently conducting research on mitigation and how to "create" a wetland

Wetland Program 8

Program Type	Research
State	Oregon
Name of Program	Research and Development (arm of Department of Fish and Wildlife)
Administering Agency	Department of Fish and Wildlife
Implementation Method	Research on fisheries and wildlife habitat improvement, for use by wildlife and fisheries managers Current research projects include techniques for rearing and releasing fish, effects of dams on reaches below dams, background studies on ocean flora and fauna relative to offshore oil leases, and the relationship of predators to downstream migrating salmon
Legal Authority	Oregon Department of Fish and Wildlife Commission sets policy and budget
Resources (Funds and Staff)	Fish and Wildlife Commission sets budget
Activities Regulated	Habitat evaluation and improvement research Applied research - do most of work in streams
Education	Not a specific part of program, but do involve public in development of fish management plans
Problems	Habitat loss - hard to maintain wild populations of fish
Success	Not specifically geared toward wetland protection but some areas have been successful
EPA Role	Generally, no role
Needed from EPA	Through EMS program - can contact them for information and problems

Wetland Program 9

Program Type	Coastal Law
State	Oregon
Name of Program	Oregon Coastal Zone Management Program (OCZMP)
Administering Agency	Many state agency statutes are incorporated into the OCZMP Department of Land Conservation and Development Counties and cities Water Resources Department Department of Environmental Quality Division of State Lands Department of Fish and Wildlife
Implementation Method	Counties and cities develop management plans and implementing ordinances to comply with statewide goals. Counties need to identify wetlands and evaluate conflicts. State reviews plans. State monitors actions of local governments for compliance with their plans
Legal Authority	Coastal Zone Management Act - Or. Rev. Stat. Chapter 541.605-695, Chapter 215.505-535 (local regulation) Attorney General Opinion No. 7755 Statewide land use planning goals: 4, 5, 6, 16, 17, 18 (state's land use planning program) (ORS 197)
Resources (Funds and Staff)	State general funds Office of Coastal Resource Management (Federal funds)
Lands Covered	The Oregon coastal zone includes all lands west of the crest of the coast range. The areas mentioned below are subject to specific goals: 1) 500' from coastal lakes, 1000' from estuaries (Goal 17), 2) all tidal lands (Goal 16), and 3) unprotected forested freshwater wetlands
Inventory and Classification	No comprehensive wetland inventory. Current mapping effort underway that will show land use designation. Digitizing estuarine management areas for coast. Noncoastal wetlands - no good inventory
Activities Regulated	Prescribe standards for county Coastal Zone Management Plans Review plans Dredge and fill, piling, riprap, etc. (Goal 16 - permitted uses)
Lands Covered	Significant shoreland wetlands identified in local plans Estuarine areas in natural management units
Compliance	County submits plan to state. If plans are inadequate, state can revise county plans, initiate enforcement orders, and withhold state funds
Education	Newsletter Ocean Book School presentations
Problems	State agency coordination Conflicts between local, state, federal rules No good state wetlands inventory
Success	Successful
EPA Role	Reviewed county plans and provided comments

	EPA has limited staff, time State sends notice to EPA on all plan amendments
Needed from EPA	Encourage them to be involved in Coastal Zone Management Plans, review and comment on plans
Taking Issues	Considered when ditches were put through a significant inland wetland Initiative pending to provide compensation to a landowner if government agency denies land use
Mitigation	In coastal intertidal areas and tidal marshes, mitigation is required for comparable values
Cumulative Impacts	Not developing method of evaluating, but would like to. Estuarine policy is that county plans are supposed to evaluate cumulative impacts of proposed development. Would like to have method for evaluating

Wetland Program 10

Program Type	Coastal Law
State	Oregon
Name of Program	Oregon Mitigation Law
Administering Agency	Division of State Lands
Implementation Method	Mitigation required as condition for alteration of estuarine tidal and intertidal marshes
Legal Authority	Or Rev. Stat. 541.626 OAR 141-85-240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262
Resources (Funds and Staff)	Administered with the Removal-Fill Law (7 full time equivalents) Funding: 20 percent application fees, 80 percent other funds from public trust lands
Lands Covered	Intertidal or tidal marsh area of an estuary
Inventory and Classification	Inventories of most estuaries prepared by Oregon Department of Fish and Wildlife
Activities Regulated	Mitigation required as condition of any permit for filling or removal of material
Exemptions	Limited statutory exemptions
Lands Covered	Mitigation provides for "creation, restoration or enhancement of an estuarine area to maintain the functional characteristics and processes of the estuary..."
Compliance	Enforced as a condition of the state Removal-Fill Permit
Education	Administrative rules were printed as a handbook
Problems	Public misunderstanding
Success	Good compliance

Wetland Program 11

Program Type	Coastal Law
State	Oregon
Name of Program	Oregon Removal-Fill Permit Program
Administering Agency	Oregon Division of State Lands
Implementation Method	Permits required Enforcement through voluntary compliance, civil or criminal actions
Legal Authority	Removal and Fill Law, 1967, amended in 1971-1985. OAR 141-85-050 through 141-85-090
Resources (Funds and Staff)	Application fees (provides less than 20 percent of costs) Investments and use of state lands 7 full time equivalents
Lands Covered	Lands within the bed or banks of the waters of the state Wetlands are defined as waters of the state
Inventory and Classification	No inventory/mapping efforts
Activities Regulated	Filling, removal or alteration of material within the bed or banks of the waters of the state of more than 50 cubic yards of material
Exemptions	Filling or removal within the beds and banks of non-navigable waterways in forest lands Some dam construction and water diversion Federal projects for navigational servitude
Compliance	Active enforcement: civil penalties up to $10,000/day Violation is a criminal offense with fines to $2,500 and one year in jail Cease and desist orders Restoration orders
Education	Presentations to public interest groups, SCS, local communities, etc. Brochure Workshops
Problems	Lack of inventory and designation of waterways under jurisdiction
Success	No quantitative measure of success. In 10 years experience, felt this was an excellent way of regulating. Better organized interagency network than other states
EPA Role	EPA does all work by phone, never on-site (most Federal regulatory agencies have same problem) Play a role in policy review
Needed from EPA	Funding EPA's regulations should encourage states to provide funding for enforcement and administration Need local EPA presence
Taking Issues	No successful legal claim Current case is prodding legislative action
Mitigation	Required for estuarine wetlands Possible for freshwater wetlands
Cumulative Impacts	No mechanism for evaluation A request for EPA funding to examine cumulative impacts issue was denied

Wetland Program 12

Program Type	Inland Law
State	Oregon
Name of Program	Oregon Removal-Fill Permit Program
Administering Agency	Oregon Division of State Lands
Implementation Method	Permits required Enforcement through voluntary compliance, civil or criminal actions
Legal Authority	Removal and Fill Law, 1967, amended in 1971-1985 OAR 141-85-050 through 141-85-090
Resources (Funds and Staff)	Application fees (provides less than 20 percent of costs) Investments and use of state lands 7 full time equivalents
Lands Covered	Lands within the bed or banks of the waters of the state Wetlands are defined as waters of the state
Inventory and Classification	No inventory/mapping efforts
Activities Regulated	Filling, removal or alteration of material within the bed or banks of the waters of the state of more than 50 cubic yards of material
Exemptions	Filling or removal within the beds and banks of non-navigable waterways in forest lands Some dam construction and water diversion Federal projects for navigational servitude
Compliance	Active enforcement: civil penalties up to $10,000/day Violation is a criminal offense with fines to $2,500 and one year in jail Cease and desist orders Restoration orders
Education	Presentations to public interest groups, SCS, local communities, etc. Brochure Workshops
Problems	Lack of inventory and designation of waterways under jurisdiction
Success	No quantitative measure of success. In 10 years experience, felt this was an excellent way of regulating. Better organized interagency network than other states
EPA Role	EPA does all work by phone, never on-site (most Federal regulatory agencies have same problem) Play a role in policy review
Needed from EPA	Funding EPA's regulations should encourage states to provide funding for enforcement and administration Need local EPA presence
Taking Issues	No successful legal claim Current case is prodding legislative action
Mitigation	Required for estuarine wetlands Possible for freshwater wetlands
Cumulative Impacts	No mechanism for evaluation A request for EPA funding to examine cumulative impacts issue was denied

Wetland Program 13

Program Type	Other Programs
State	Oregon
Name of Program	Waterfowl Program
Administering Agency	Department of Fish and Wildlife
Implementation Method	Population monitoring Set seasons for waterfowl hunting
Legal Authority	Oregon Fish and Wildlife Code (scattered sections)
Resources (Funds and Staff)	Wildlife Fund Federal Pittman-Robertson Funds Waterfowl Stamp Program
Lands Covered	Not applicable
Inventory and Classification	None
Problems	Funding Competing interests for same land base
Success	Not enough success
EPA Role	No direct role. Indirect by setting regulations governing water quality
Needed from EPA	Do not know

Wetland Program 14

Program Type	Other Programs
State	Oregon
Name of Program	Oregon Duck Stamp Program
Administering Agency	Oregon Department of Fish and Wildlife
Implementation Method	Wetland development Hunter education program Special permit hunting season $100,000 to DU for habitat project in Alaska Crop land planting on waterfowl areas
Legal Authority	Waterfowl Stamp Bill 2925
Resources (Funds and Staff)	Sale of stamps and limited edition prints and other associated artwork, posters, and decoys
Inventory and Classification	None
Education	Magazine articles News releases
Problems	This year (second year) large drop in sales First year sales were approximately 15,000 prints, while the second year sales were only 3,000
Success	Too new to have big impact, but gives potential new revenue source
EPA Role	No role
Needed from EPA	Not sure

Wetland Program 15

Program Type	Coastal Law
State	Oregon
Name of Program	Oregon Scenic Waterway Law
Administering Agency	State Highway Commission Division of State Lands State Land Board
Implementation Method	Division of State Lands regulates all fills and removals Joint permit program for oceanshore access and/or construction
Legal Authority	Or. Rev. Stat. Chapter 390.605 to 390.770
Lands Covered	Ocean shore area, beaches Scenic rivers and along their banks
Activities Regulated	Vehicles may be banned All fill and removal Beach front protection structure (sea walls, riprap, etc.)
Education	Public meetings Brochures
Problems	No good set of regulatory criteria for shorefront protective structures
Success	Good success

Wetland Program 16

Program Type	Other Programs
State	Oregon
Name of Program	Oregon Forest Practices Act
Administering Agency	State Forester
Implementation Method	Must give written approval
Legal Authority	Or. Rev. Stat. S.527.610-527.370
Lands Covered	Stream channels Wetlands
Activities Regulated	Forestry (all practices) Stream channel alteration

Wetland Program 17

Program Type	Floodplain Regulation
State	Oregon
Name of Program	County Floodplain Ordinances
Administering Agency	Most city and county plans regulate floodplain activities to be eligible for FEMA insurance rates and comply with Goal 6 of Statewide Planning Goals

Wetland Program 18

Program Type	Drainage Regulation
State	Oregon
Name of Program	Drainage of Protected Wetlands
Administering Agency	Some local plans regulate drainage of protected wetlands

Wetland Program 19

Program Type	Local Programs
State	Oregon
Administering Agency	Cities, Counties, Coastal Jurisdictions, and local ASCS County Committees
Legal Authority	ORS 197 The Farm Bill provides wetland protection through local ASCS County Committees
Activities Regulated	All cities and counties have comprehensive land use plans, many of which regulate wetland development. All coastal jurisdictions regulate fill and removal in estuaries, for example, and in significant shoreland wetlands fill and removal is prohibited in protected wetlands. Some inland wetlands are protected through local ordinances
Compliance	A CZM program is based upon incorporation of state land use policies (19 statewide goals) into local comprehensive plans. The goals of particular relevance to wetland regulation are goals 5, 15, 16 and 17. All local governments and state agencies must comply with these policies (see ORS 197)

Oregon State Wetland Contacts (Council of State Governments Database)

Wetland Contact 1

Program Type	Coastal Zone Management
Name	Patty Snow
Organization	Coastal Zone Management Program Dept. of Land Conservation
Address	1175 Court Street N.E.
City	Salem
State	Oregon
Zip Code	97310
Phone Number	(503) 378-4932

Wetland Contact 2

Program Type	404 Permits
Name	Ken Bierly
Organization	Division of State Lands
Address	1445 State Street
City	Salem
State	Oregon
Zip Code	97310
Phone Number	(513) 229-5358

Wetland Contact 3

Program Type	404 Permits
Name	Earl Johnson
Organization	Division of State Lands
Address	1445 State Street
City	Salem
State	Oregon
Zip Code	97310
Phone Number	(513) 229-5358

Wetland Contact 4

Program Type	401 Permits
Name	Glen Carter
Organization	Dept. of Env. Quality
Address	P.O. Box 1760
City	Portland
State	Oregon
Zip Code	97207
Phone Number	(503) 229-5358

Wetland Contact 5

Program Type	Taxation Programs
Name	Bill Haight
Organization	Non-Game Program Dept. of Fish and Wildlife
Address	P.O. Box 59
City	Portland
State	Oregon
Zip Code	97207
Phone Number	(503) 229-5452

Wetland Contact 6

Program Type	Taxation Programs
Name	Tony Faust
Organization	Riparian Tax Incentive Program Dept. of Fish and Wildlife
Address	P.O. Box 59
City	Portland
State	Oregon
Zip Code	97207
Phone Number	(503) 229-5679

Wetland Contact 7

Program Type	Taxation Programs
Name	Ken Durbin
Organization	Duck Stamp Program Dept. of Fish and Wildlife
Address	P.O. Box 59
City	Portland
State	Oregon
Zip Code	97207
Phone Number	(503) 229-5463

Wetland Contact 8

Program Type	Research
Name	Every Wagner
Organization	Duck Stamp Program Dept. of Fish and Wildlife
Address	P.O. Box 59
City	Portland
State	Oregon
Zip Code	97207
Phone Number	(503) 229-5463

Wetland Contact 9

Program Type	Research
Organization	Oregon State University
Address	303 Extension Hall
City	Corvallis
State	Oregon
Zip Code	97331
Phone Number	(503) 754-3241

Wetland Contact 10

Program Type	Research
Name	Mike Graybill
Organization	South Slough National Estuary
Address	P.O. Box 5417
City	Charleston
State	Oregon
Zip Code	97420
Phone Number	(503) 888-5558

Wetland Contact 11

Program Type	Flood Plain Programs
Name	Jim Kennedy
Organization	Land Conservation & Development
Address	1175 Court Street, N.E.
City	Salem
State	Oregon
Zip Code	97310

South Dakota State Wetland Programs (Council of State Governments Database)

Wetland Program 1

Program Type	401 Permits
State	South Dakota
Name of Program	401 Water Quality - State Water Quality Certification Program
Administering Agency	Department of Water and National Resources
Implementation Method	Permit/404 Certification
Resources (Funds and Staff)	Amount is unknown. One person.
Lands Covered	State waters and waters of the U.S.
Inventory and Classification	None
Activities Regulated	Activities below minimum standards exempted
Exemptions	Activities below minimum standards exempted
Lands Covered	Same as those defined by EPA 404(b)(1) guidelines
Compliance	Site inspection and response to inquiries
Education	None
Problems	No methodology to quantify cumulative impact
Success	Programs appears to be effective
EPA Role	Program review
Needed from EPA	More closely coordinate with state personnel on 404 permit issues
Taking Issues	No cases
Mitigation	Require various engineering solutions to minimize pollution from discharges
Cumulative Impacts	Make subject evaluations only
access number	281

Wetland Program 2

Program Type	Other Programs
State	South Dakota
Name of Program	Special Use Permits for Lake Bottoms
Administering Agency	State Division of Game, Fish and Parks
Implementation Method	Permit Program
Legal Authority	S.D. Compiled Law Ann. Subsec. 41-2-32, 41-2-18
Resources (Funds and Staff)	Unknown
Lands Covered	Shallow lake bottoms (vegetated shallows)
Inventory and Classification	None
Activities Regulated	Dredging and filling.
Exemptions	Private lakes and ponds.
Lands Covered	Same as Clean Water Act with emphasis on Game and Fish values.
Compliance	Limited permit enforcement program.
Education	None
Problems	Funding
Success	Moderate
EPA Role	Limited to 404 review
Needed from EPA	Show stronger enforcement position.
Taking Issues	No cases
Mitigation	Required if adverse impacts could occur.
Cumulative Impacts	Considered, but no criteria for evaluation has been developed.
access number	428

South Dakota State Wetland Contacts (Council of State Governments Database)

Wetland Contact 1

Program Type	Other Programs
Organization	Dept. of Water and Natural Resources Water Quality Division
Address	Foss Building
City	Pierre
State	South Dakota
Zip Code	57501
Phone Number	(605) 773-3351
Access Number	381

Wetland Contact 2

Program Type	Flood Plain Programs
Name	Darrell Dvorak
Organization	Emergency and Disaster Service
Address	State Capitol Building
City	Pierre
State	South Dakota
Zip Code	57501
Access Number	474

Utah State Wetland Programs (Council of State Governments Database)

Wetland Program 1

Program Type	Section 401 Permits
State	Utah
Name of Program	State Water Quality Certification Program
Administering Agency	Department of Natural Resources and Energy Department of Health
Implementation Method	Via section 401 Water Quality Certification
Legal Authority	SWPCA
Resources (Funds and Staff)	Section 401 funds (no taxation programs)
Lands Covered	State owned wetlands
Inventory and Classification	NWI mapping in progress with assistance from Corps' Sacramento District
Activities Regulated	Ambient water quality standards for flooded wetlands
Exemptions	Non-state owned waters and wetlands. Current emphasis is on chemical and physical attributes. Biological attributes are only minimally considered
Lands Covered	Those described by section 404(b)(1) guidelines for nonflooded wetlands
Compliance	Acts on what is discovered or reported
Education	None
Problems	Need to enforce water quality standards, surface water drainage, ponds and runoff and hazardous chemicals Losing freshwater waterfowl nesting areas very rapidly due to rapid rise of Great Salt Lake
Success	Cooperative federal mapping effort is working well
EPA Role	Could assist with development of wetlands policy and back state up with strong enforcement posture
Needed from EPA	Establish closer working relationship with state by taking more active enforcement role
Taking Issues	No cases
Mitigation	Currently developing policy similar to USFWS
Cumulative Impacts	No criteria or assessment procedures

Utah State Wetland Contacts (Council of State Governments Database)

Wetland Contact 1

Program Type	Freshwater Wetland Programs
Name	Waterfowl Program Coordinator
Organization	Utah Division of Wildlife Resources
Address	1596 W. No. Temple
City	Salt Lake City
State	Utah
Zip Code	84116
Phone Number	(801) 533-9333

Wetland Contact 2

Program Type	401 Permits
Name	Dr. Donald Hilden
Organization	Bureau of Water Pollution Control
Address	P.O. Box 45500
City	Salt Lake City
State	Utah
Zip Code	84145
Phone Number	(801) 533-6146

Wetland Contact 3

Program Type	Legal Council/Legislative Liason
Name	Robert Hasenyager
Organization	Utah Division of Wildlife Resources
Address	1596 W. No. Temple
City	Salt Lake City
State	Utah
Zip Code	84116
Phone Number	(801) 533-9333

Wetland Contact 4

Program Type	Acquisition Programs
Name	Dwight Bunnell
Organization	Utah Division of Wildlife Resources
Address	1596 W. No. Temple
City	Salt Lake City
State	Utah
Zip Code	84116
Phone Number	(801) 533-9333

Wetland Contact 5

Program Type	Mapping
Name	Waterfowl Program Coordinator
Organization	Utah Division of Wildlife Resources
Address	1596 W. No. Temple
City	Salt Lake City
State	Utah
Zip Code	84116
Phone Number	(801) 533-9333

Wetland Contact 6

Program Type	Legal Council/Legislative Liason
Name	Michael M. Quealy
Organization	Assistant Attorney General Dept. of Natural Resources Bldg.
Address	1636 W. No. Temple
City	Salt Lake City
State	Utah
Zip Code	84116
Phone Number	(801) 533-4446

Wetland Contact 7

Program Type	Research
Name	Waterfowl Program Coordinator
Organization	Utah Division of Wildlife Resources
Address	1596 W. No. Temple
City	Salt Lake City
State	Utah
Zip Code	84116
Phone Number	(801) 533-9333

Wetland Contact 8

Program Type	Other Programs
Name	Dr. Reed Y. Oberndorferl
Organization	Bureau of Water Pollution Control
Address	P.O. Box 45500
City	Salt Lake City
State	Utah
Zip Code	84116
Phone Number	(801) 533-9333

Wetland Contact 9

Program Type	Flood Plain Programs
Name	James D. Harvey
Organization	Comprehensive Emergency Management
Address	1543 Sunnyside Avenue
City	Salt Lake City
State	Utah
Zip Code	84108

Washington State Wetland Programs (Council of State Governments Database)

Wetland Programs 1

Program Type	Section 401 Permits
State	Washington
Name of Program	State Water Quality Certification Program
Administering Agency	Washington State Department of Ecology
Implementation Method	Water quality certification for federal permits/licenses
Legal Authority	Section 401, Clean Water Act
Resources (Funds and Staff)	State general revenue funds Chapter 106 funds
Lands Covered	Jurisdiction determined by appropriate Federal agency
Inventory and Classification	All mapped
Activities Regulated	Dredge and fill FERC hydropower Coast Guard permits
Exemptions	Federal exemptions Wood waste (Corps of Engineers claims it is out of their jurisdiction) Garbage disposal Automobile body disposal Downstream impacts on wetlands not considered
Lands Covered	Use surface water quality standards on wetlands
Compliance	section 404 compliance via Corps of Engineers lead. If water quality standards are not met, state will withhold certification
Problems	Underestimated value of wetlands Acquisition needed to provide adequate wetlands protection Wood waste (unregulated) is primary cause of wetland destruction
Success	Yes - slow process
EPA Role	Section 404 - technical assistance and review
Needed from EPA	None
Cumulative Impacts	Corps may consider the cumulative impacts of development on wetlands as noted on Page 34, OTA Regional Study, 33 CFR

Wetland Programs 2

Program Type	State Environmental Policy Acts
State	Washington
Name of Program	State Environmental Policy Act 1971
Administering Agency	City or county staff determines which agency (city, county, state) will be the lead agency
Implementation Method	Can require Environmental Impact Statements
Legal Authority	Chapter 43.21C RCW (SEPA) Chapter 197-11 Wash. Admin. Code (Regulations)
Resources (Funds and Staff)	State general revenue funds
Lands Covered	Proposals with a potentially significant impact Some are categorical exemptions
Activities Regulated	All public decisions regulated. Criteria parallel NEPA
Exemptions	Single family homes Commercial buildings under 4,000 square feet Parking lots for 20 cars or less SEPA rules allow "flexible thresholds" for some exemptions -- counties can establish size of facility which is exempt
Compliance	State has recourse through appeals to the policy board or civil court system
Education	Annual workshops
Problems	Lack of enforcement. No clear punitive approach
Success	Success varies depending on location. Can be a good tool if officials want to use it
EPA Role	When NEPA and SEPA are both in effect -- try to jointly develop EIS
Needed from EPA	NEPA should recognize SEPA

Wetland Programs 3

Program Type	Acquisition Programs
State	Washington
Name of Program	Game Department Capital Budget Acquisition
Administering Agency	Game Department
Implementation Method	Fee simple acquisition Conservation easements (try for easements "in perpetuity") Donations The process for acquiring wetlands: 1) regional staff indicates a need for property, 2) landowner indicates desire to sell or donate land, 3) Capital Budget Acquisition Team priortizes properties, and 4) biennium legislative approval of capital budgets, all purchases are line items
Legal Authority	Wash. Rev. Code S. 77.12.200
Resources (Funds and Staff)	State game revenue funds Federal funds (Pittman-Robertson, Dingle-Johnson, LWCF) State Duck Stamp (new this year) Biennium legislative approval of capital budgets. Purchases are normally line items. Some omnibus projects are now being accepted
Lands Covered	Big game habitat Waterfowl Public fishing areas Recreation areas Habitat plots (pheasant release) Small game habitat Natural areas
Inventory and Classification	Have inventory of lands they have acquired Starting to inventory lands they want to acquire
Compliance	Wildlife agents regulate properties owned by the state
Education	Project Wildlife School programs Public presentations
Problems	Lack of money Development and encroachment on habitat
Success	Program just beginning
EPA Role	No role
Needed from EPA	Provide additional funding

Wetland Programs 4

Program Type	Taxation Programs
State	Washington
Name of Program	Open Space Tax Act
Administering Agency	Counties
Implementation Method	Counties adopt open space tax programs which allow for reduced taxation for open space lands
Legal Authority	Wash. Rev. Code Chapter 84.36
Lands Covered	Open space land can include wetlands, beaches, tidal marshes, and shorelines
Activities Regulated	Enrollment of lands in the program qualifies them for reduced taxation

Wetland Programs 5

Program Type	Coastal Law
State	Washington
Name of Program	Shoreline Management Act, 1976
Administering Agency	Department of Ecology (DOE) Local authorities
Implementation Method	Each local jurisdiction establishes a Shoreline Master Program (SMP), requires DOE approval Require Substantial Development Permits for all activities (with some exceptions) from local governments All permits are reviewed by DOE staff and may be appealed to the Shoreline Hearings Board Sometimes requires Environmental Impact Statement
Legal Authority	Wash. Rev. Code Ann. S90.58.010 to S90.58.930 Chapter 173.16 King County and Island County have wetland protection ordinances
Lands Covered	Lakes 20 acres or more, and associated wetlands Streams with a mean annual flow greater than 20 cfs and associated wetlands All marine waters and associated wetlands Lands extending landward 200 ft. of the high water mark and associated wetlands
Inventory and Classification	Inventories exist for 15 coastal counties (all coastal counties) A few other counties have inventoried wetlands NWI conducted by the U.S. Fish and Wildlife Service, is approximately 80 percent complete
Exemptions	Many exemptions including projects costing $1,000 or less No alternative analysis required Often downstream impact on wetlands not considered

Wetland Programs 6

Program Type	Coastal Law
State	Washington
Name of Program	Snohomish Estuary Plan '78 (wetland reviews have been done on 6 estuaries on the West Coast)
Implementation Method	County regulation
Legal Authority	Snohomish County Comprehensive Land Use Plan
Inventory and Classification	The estuary has been mapped, classified and incorporated into the county comprehensive plan

Wetland Programs 7

Program Type	Coastal Law
State	Washington
Name of Program	Grays Harbor Estuary Plan 1975

Wetland Programs 8

Program Type	Inland Law
State	Washington
Name of Program	State Hydraulics Code
Administering Agency	Department of Fish and Game
Implementation Method	Permits required
Legal Authority	Wash. Rev. Code Ann. Chapter 75.20.100
Resources (Funds and Staff)	Game fund (sale of hunting and fishing licenses)
Lands Covered	Waters of the state - in ordinary high water mark of state waters
Inventory and Classification	No inventory/mapping
Activities Regulated	Any use which would use, divert flow, or change waters of the state or stream beds
Exemptions	Areas not in waters of the state Irrigation ditches which were not natural streams All completely artificial structures
Lands Covered	Fish, habitat, water quality
Compliance	Violation is a misdemeanor. Can have up to 1 year in jail and $1,000 fine
Education	Work with county planning departments and large landowners
Problems	Not enough staff makes monitoring difficult Court enforcement cases given low priority by judges when compared to other court cases State has no cohesive wetland program
Success	Yes - successful program although not specifically for wetlands. Try and help local agencies in protecting wetlands
EPA Role	No role Number of EPA staff people is very limited
Needed from EPA	More specific water quality standards
Other Functions	Comments: Lots of unprotected wetlands - many still lost. Greatest gains recently have been made at the local level. Good county programs include: 1) Island County Zoning, 2) King County - development planned around wetlands, 3) City of Bellevue - wetland protection agency, 4) Snohomish County - 4 biologists are doing wetland inventory, and 5) Thurston County (Olympia) - ordinance calling for restoration of wetlands. Also, Indian Tribes working on wetland protection include the Muckleshoot and Suquamish Indian Tribes

Wetland Programs 9

Program Type	Floodplain Regulation
State	Washington
Name of Program	Flood Control Zone Permit Program (FCZPP) Flood Control Assistance Account Program (FCAAP)
Administering Agency	Department of Ecology (DOE)
Implementation Method	Establishes flood control zones DOE administers FCZPP pursuant to WAC 508-60
Legal Authority	Chapter 86.16 of RCW Flood Control Zones established by State Chapter 508-60 WAC, administration of the Flood Control Permit Program Chapter 86.26 RCW: FCAAP Administrative Rules CH. 173-145 WAC
Resources (Funds and Staff)	FCAAP: $4 million/biennium matching grant funds are provided for flood control and maintenance projects by local entities
Lands Covered	18 Flood Control Zones, includes 1/3 of the state's flood prone communities and flood hazard areas
Activities Regulated	Construction, fill

Wetland Programs 10

Program Type	Other Programs
State	Washington
Name of Program	Public Lands Act
Administering Agency	Department of Natural Resources
Implementation Method	Selects sites, leases and manages state lands resources Relies on building permits for information regarding each proposal
Legal Authority	Wash. Rev. Code Ann. Chapter 79.01
Lands Covered	Area from low water mark to high water mark
Activities Regulated	Dredge, fill, marinas, aquaculture

Wetland Programs 11

Program Type	Pending Legislation
State	Washington
Name of Program	Initiative 90
Implementation Method	Portion of state sales tax would be dedicated for habitat development, some acquisition Will be a referendum on this fall's election ballot
Legal Authority	Wash. Rev. Code Ann., Chapter 76.09

Washington State Wetland Contacts (Council of State Governments Database)

Wetland Contacts 1

Program Type	Freshwater Wetland Programs
Name	Bill Alkire
Organization	Dept. of Ecology
Address	Mail Stop PV-11
City	Olympia
State	Washington
Zip Code	98504
Phone Number	(206) 459-6289

Wetland Contacts 2

Program Type	401 Permits
Name	Mike Palko
Organization	Dept. of Ecology
Address	Mail Stop PV-11
City	Olympia
State	Washington
Zip Code	98504
Phone Number	(206) 459-6289

Wetland Contacts 3

Program Type	Acquisition Programs
Name	Doris Gambill
Organization	Dept. of Game
Address	600 North Capitol Way
City	Olympia
State	Washington
Zip Code	98504
Phone Number	(206) 753-5730

Wetland Contacts 4

Program Type	Other Programs
Name	Bob Zeigler
Organization	Dept. of Game
Address	600 North Capitol Way
City	Olympia
State	Washington
Zip Code	98504
Phone Number	(206) 753-3318

Wetland Contacts 5

Program Type	Flood Plain Programs
Name	Edward C. Hammersmith, P.E.
Organization	Dept. of Ecology
Address	Mail Stop PV-11
City	Olympia
State	Washington
Zip Code	98504

Wyoming State Wetland Programs (Council of State Governments Database)

Wetland Program 1

Program Type	Section 401 Permits
State	Wyoming
Name of Program	401 Water Quality Program
Administering Agency	Department of Environmental Quality, Water Quality Division
Implementation Method	Permit application program State certifies section 404 permit applications and requests mitigation
Legal Authority	W.S. Sec. 35-11-103(c)(viii)
Resources (Funds and Staff)	Amount unknown One person (.15 man year)
Lands Covered	Only those found within the stream channel or regulated by the U.S. Army Corps of Engineers
Inventory and Classification	Partially completed by the Wyoming Game and Fish Department
Activities Regulated	All activities impacting water quality such as point source discharges and non-point source discharges
Exemptions	Emergency work activities
Lands Covered	Those that directly pertain to water quality and protect waterfowl
Compliance	Limited to what is discovered on routine inspection trips and what is reported by other agency personnel or private individuals
Education	None
Problems	Considering giving up program due to political concern over state rights
Success	Limited due to lack of political support
EPA Role	Limited to section 401 review and Corps section 404 permit review and comment
Needed from EPA	EPA needs to provide a stronger enforcement posture within state
Taking Issues	No cases
Mitigation	Typically, require compliance with Game and Fish Commission Mitigation Policy if waterfowl use area is involved
Cumulative Impacts	No criteria or assessment procedures

Wyoming State Wetland Contacts (Council of State Governments Database)

Wetland Contact 1

Program Type	Other Programs
Name	Mike Stone
Organization	Game and Fish Dept.
City	Cheyenne
State	Wyoming
Zip Code	82002
Phone Number	(307) 777-7686

Wetland Contact 2

Program Type	401 Permits
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Wetland Contact 3

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